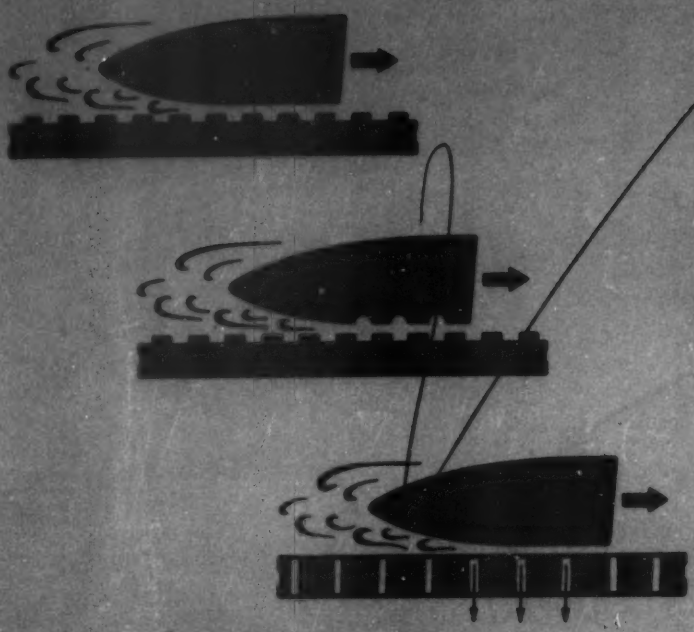
APRIL 1961

IN TWO SECTIONS: SECTION ONE

THE PAPER INDUSTRY



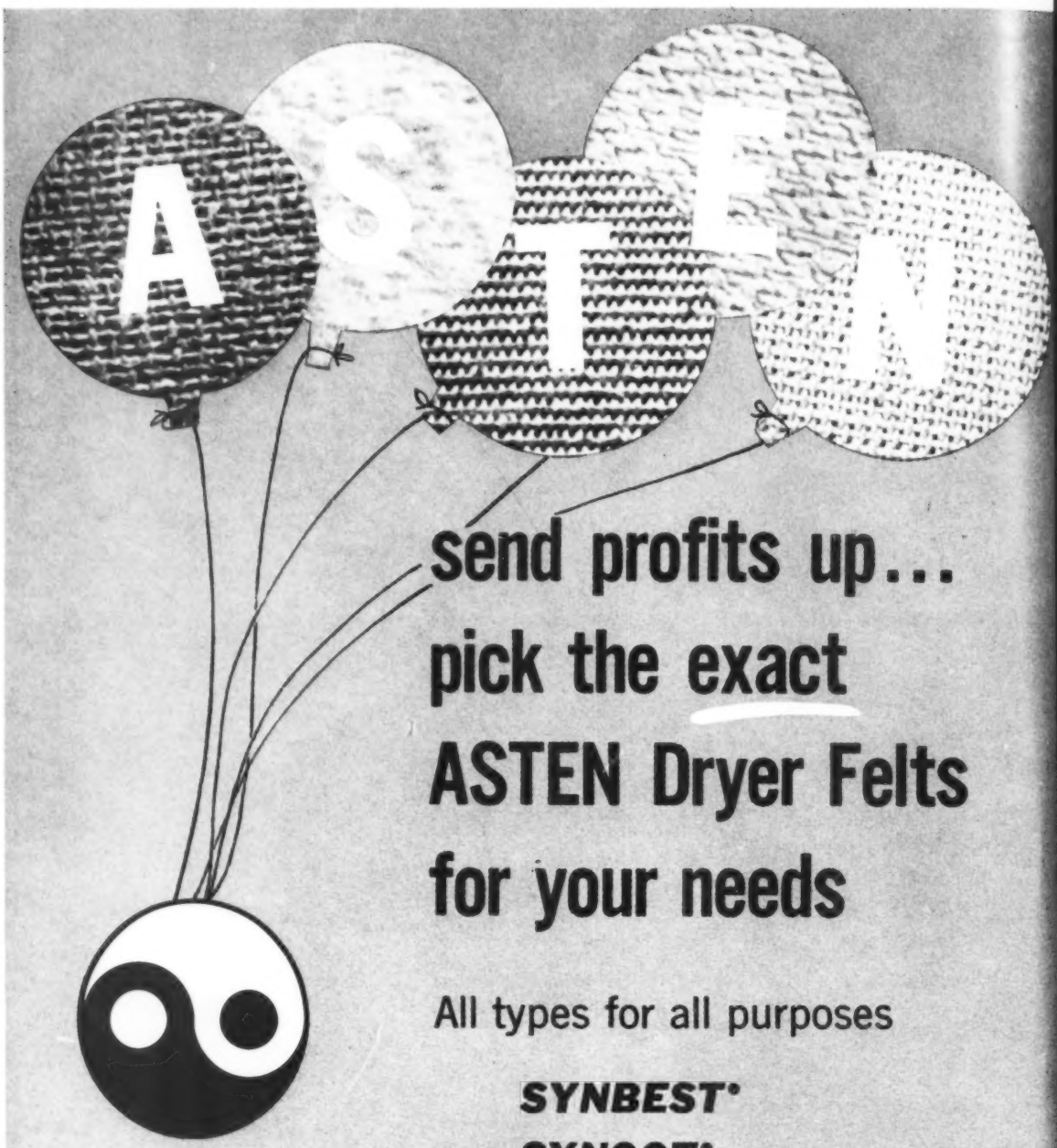
DETROIT PUBLIC LIBRARY

APR 22 1961

TECHNOLOGY DEPARTMENT

- Pigment flocculation and deflocculation
- The Vokes Rotor in Hydrapulpers
- Automation in finishing, shipping and converting
- Clarifiers solve effluent problems

Publishers of PAPER AND PULP MILL CATALOGUE



send profits up... pick the exact ASTEN Dryer Felts for your needs

All types for all purposes

SYNBEST*

SYNCOT*

ASBESTOS

SYNTHETIC

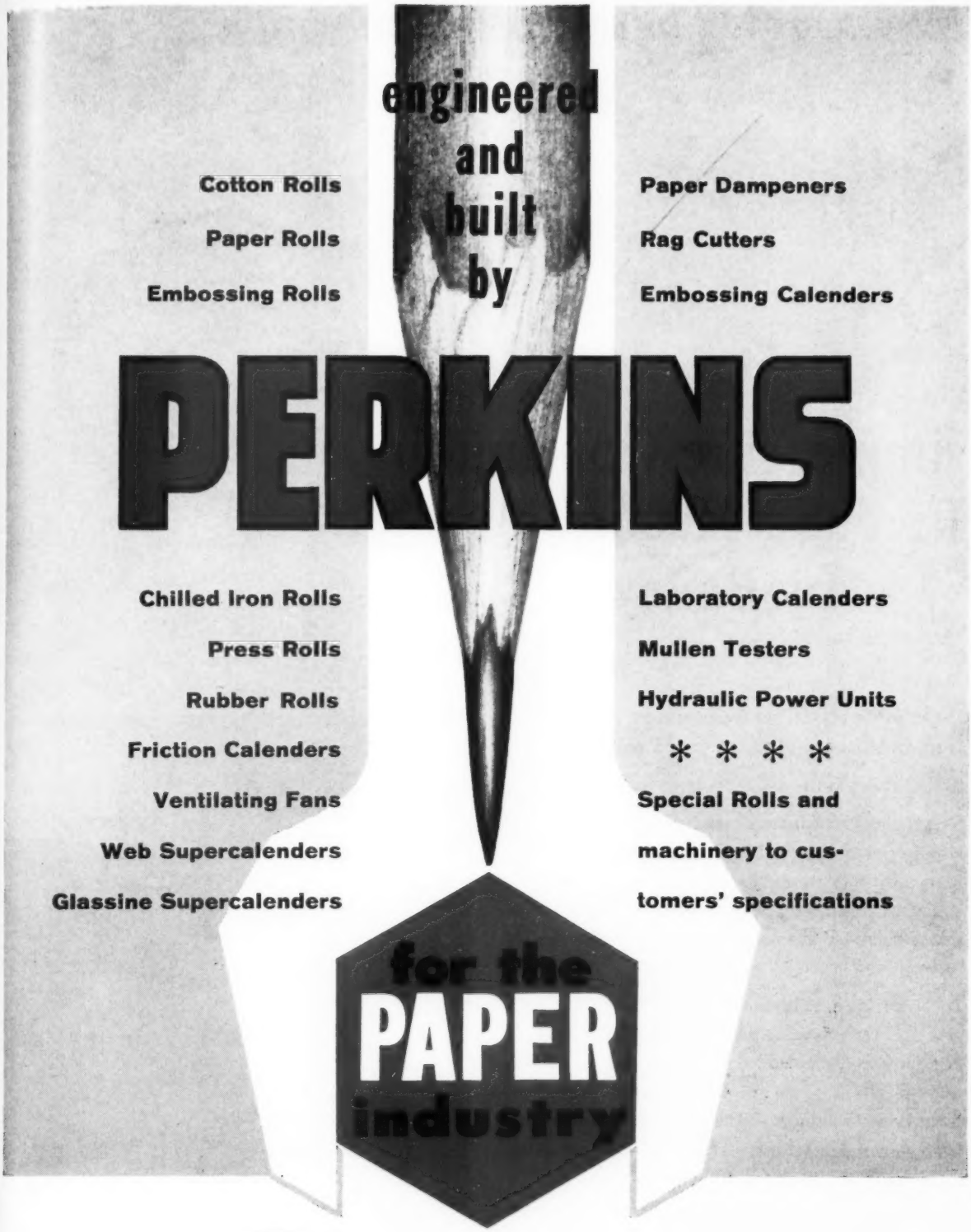
"Economy in the long run"

ASTEN-HILL MFG. CO. Philadelphia 29, Pa.
Walterboro, S. C.
Salem, Ore.

ASTEN-HILL LIMITED Valleyfield, Que.

* FREE SEAM BOOK—Write today for your copy of 28-page book on dryer felt seams.

For more data circle 101 on Post Card



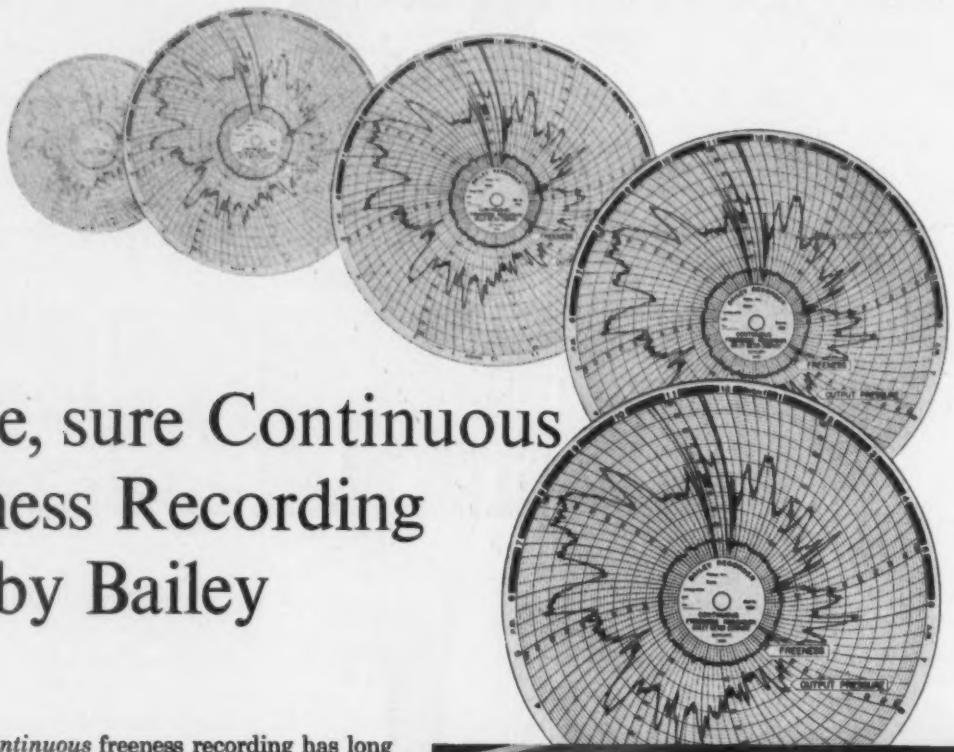
THE WORLD'S LARGEST MANUFACTURERS OF CALENDER ROLLS

B. F. PERKINS & SON, INC.

HOLYOKE
MASSACHUSETTS

For more data circle 102 on Post Card

Now...proved in continuous operation...



simple, sure Continuous Freeness Recording by Bailey

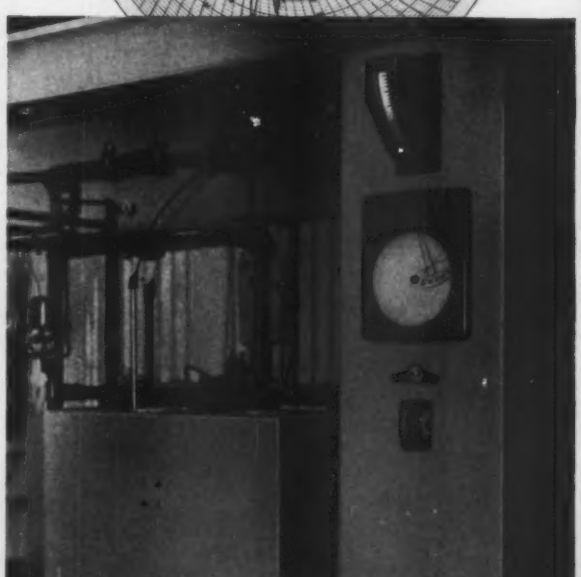
Dependable, *continuous* freeness recording has long been an objective of the pulp and paper industry.

Today it is a fact.

The Bailey Continuous Freeness Recorder, based on simple principles and utilizing equipment well-known by the pulp and paper industry, now provides a means for dependable, continuous measurement of freeness, proved in successful, continuing service for more than a year.

Its operation enables more accurate control of pulp stock characteristics...automatic control of refiners and jordans for sustained product quality. Performance is trouble-free . . . maintenance, negligible. Your Bailey Engineer will be glad to give you details. Call your nearest Bailey District Office, or write.

P151-1



Bailey Continuous Freeness Recorder in operation at a Southern newsprint plant.

PULP AND PAPER DIVISION

BAILEY METER COMPANY

1058 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada — Bailey Meter Company Limited, Montreal

For more data circle 103 on Post Card

VOL. 43 NO. 1 APRIL 1961

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), founder

PUBLICATION STAFF:

President and General Manager
A. SCOTT DOWD

Secretary
EDLA DURBON

•

Editorial Director
A. W. J. DYCK, Ph.D.

News Editor
BRUCE H. BRAMMER

Editorial Assistant
SUSAN E. HENRY

•

Market Analyst
JEROME KASSIDAY

Advertising and Production Manager
CHARLES E. DOWD

Production Assistant
SEVER M. PEDERSON

Circulation Manager
JOHN H. REARDON

Assistant Circulation Manager
LEONA M. NUTTALL

ADVERTISING REPRESENTATIVES:

CHICAGO 5, ILL.
JACK HENDERSON
431 South Dearborn Street
Wabash 2-3543

CLEVELAND 7, OHIO
RICHARD E. CLEARY INC.
15515 Detroit Avenue
Lakewood 1-7125

NEW YORK 17, N.Y.
CHARLES G. PECK
299 Madison Avenue
Murray Hill 2-2499

BIRMINGHAM 9, ALA.
FRED W. SMITH
1201 Forest View Lane—Vesthaven
Tremont 1-5762

PASADENA, CALIF.
MURRAY BOTHWELL
234 East Colorado St.
Murray 1-9155

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

Published at 1501 Washington Road, Mendota, Illinois.

Address all correspondence to:
Fritz Publications, Inc.
431 South Dearborn Street
Chicago 5, Illinois

BPA Member: Business Publications Audit of Circulation Inc.

Accepted as controlled circulation publication at Mendota, Ill.

Subscription rates: United States, U. S. Possessions and Canada $3.00 for one year. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

The PAPER INDUSTRY is indexed regularly in Engineering Index and Industrial Arts Index. An index to each volume is issued annually by the publisher as a part of the April number. ©1961 by Fritz Publications, Inc.

contents

5 Editorial: How effective is your market research and planning?

15 Mind your own business — *by Ted Pollack*

72 Whither?: New industrial rubber lining — New anti-slip surface finish — New mortar for construction — Jumbo garbage bags to replace cans — Japan expected to enter world chemical markets — Low-friction surface on rubber

22 Rheology of paper coatings: Part IV — Pigment flocculation and deflocculation — *by R. A. Diehm*

25 Automation in finishing, shipping and converting — *by Jesse P. Rambo*

26 Clarifiers solve effluent problems — *by Leo Walter*

28 Improved defibering and capacity increases in stock preparation — *C. H. Kohlhepp*

30 A review on paper week — *by Warren Bullock*

33 Paper industry in the far East

39 Current comments

39 Corporation changes

41 Industry news

41 W. S. Tyler introduces fourdrinier wire of stainless steel

41 Marathon converts spent liquor to marketable by-product

41 Training for profit

42 Recent expansions

42 Field will move into custom-designed plant

44 Sorg Paper installs rotoformer wet end

46 Coming events

51 Names in the news

53 Foreign abstracts

55 Patent reviews

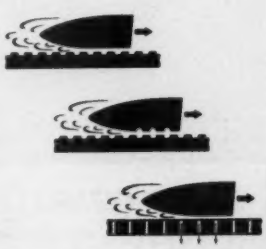
57 New products

65 New Literature

69 Market quotations

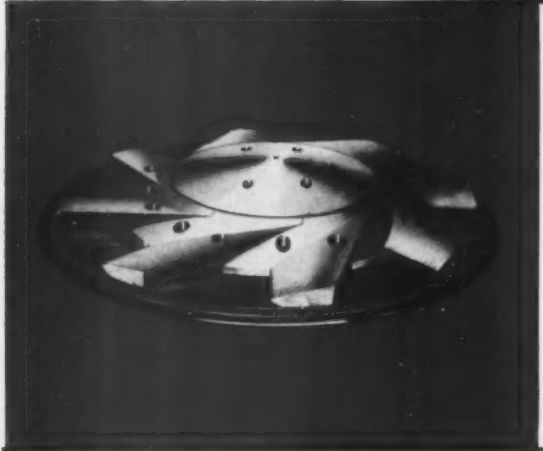
70 Necrology

71 Index to advertisers



FRONT COVER—Cross sections of the Vokes rotor vane used in conjunction with (top and center) a bar attrition ring and (bottom) with a perforated extraction bedplate.

No. 2000
goes to KVP Sutherland



"Service and performance" . . . that's the basis for the remarkable success of the world-famous Black-Clawson Hydrapulper® . . . A success story that had its beginning in 1939 when the Hydrapulper was developed.

KVP Sutherland bought one of the very earliest Hydrapulpers, and No. 2000, which was recently shipped to Parchment, Michigan, makes their 14th Hydrapulper. Equipped with the new Vokes Rotor, No. 2000 incorporates the latest in a succession of design and performance improvements made over the years.

SHARTLE DIVISION
Middletown, Ohio
COMPLETE STOCK PREPARATION SYSTEMS

BLACK-CLAWSON

For more data circle 104 on Post Card

from our point of view

How effective is your market research and planning?

The paper industry's growing interest in export markets and the 1960-61 recession have revived interest in the application of market research methods in the shaping of company planning. The renewed interest in market research has also brought a critical appraisal of the methods used in forecasting trends and the size of future market.

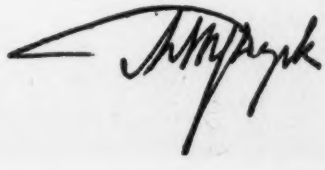
The critical appraisal stems from the realization that management, often not too familiar with the statistical approach, has permitted itself to be misled by making erroneous interpretations or over-simplifications of results supplied by the market research departments. The lack of good communications that sometimes exist between management and the market research departments adds to the confusion, with the result that there follows disillusionment with market research methods often leading to a curtailment of the wide scope of effort needed by an efficiently operating market research group.

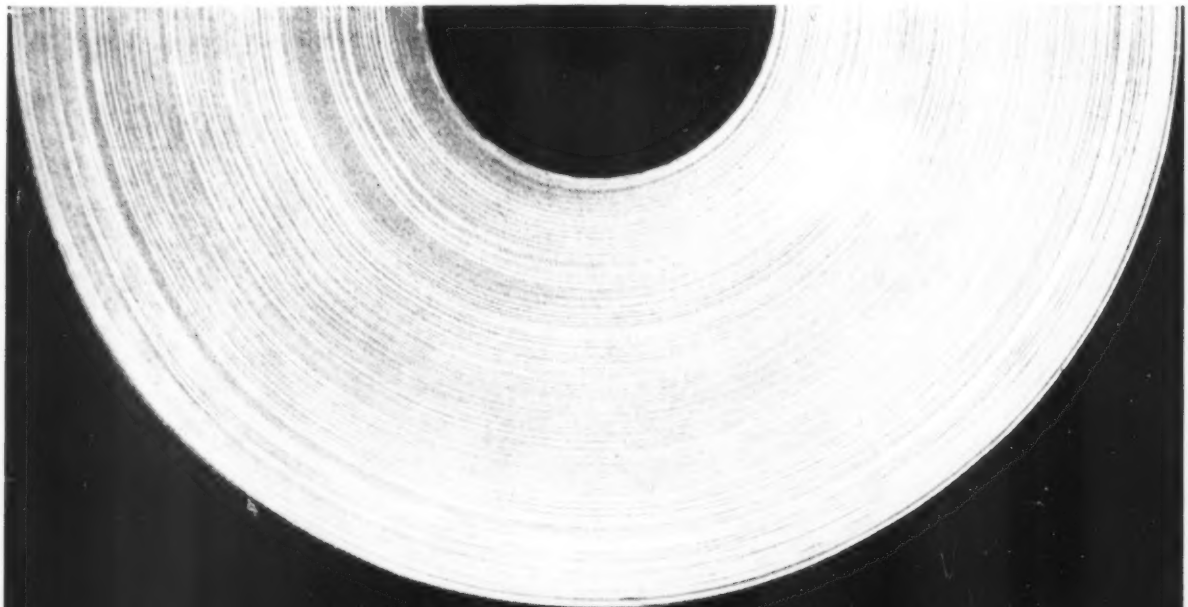
In organizations where the limitations imposed by statistical methods are clearly recognized and given due consideration, economic forecasts are being made with amazing accuracy and management has no hesitation in making use of these with complete confidence.

The complexity of today's economic climate and the strategic planning a company has to undertake in order to maintain or improve its competitive position, have made market research one of the indispensable operations of many companies. No longer does a successful company make use of "magic indicators" or rely on sudden, inspired hunches to plan its future or predict the market for its products.

As a minimum requirement, it is expected that a market research group should be able to anticipate the company's customer requirements over a 3 to 5 year period. As an optimum requirement it should be able, within statistical limitations, to forecast trends and the effects of various economic, sociological and technological developments on the company's markets and growth over a long-range period.

It is of particular importance to know what technological progress competing companies are making, what scientific knowledge will be available generally, and what the effect of these impacts will be on the company's products. While many companies are inclined to ignore the impact of technological factors on their future growth, it is these factors in particular that determine a company's major opportunities and its major threats.





- FAST, EFFICIENT DELIVERY
- EXPANDED PRODUCTION CAPACITY
- VAST NATURAL RESERVES

You get extra advantages when you specify these quality Trona® chemicals . . .

SALT CAKE AND SODIUM CHLORATE FOR PULP AND PAPER

Unlimited Salt Cake reserves and uniform, dependable production at **TRONA,** Calif. . . . a 50% increase in Sodium Chlorate capacity at **ABERDEEN,** Miss. . . . plus extensive modernization at **HENDERSON,** Nev. . . . make Trona your best source of supply.

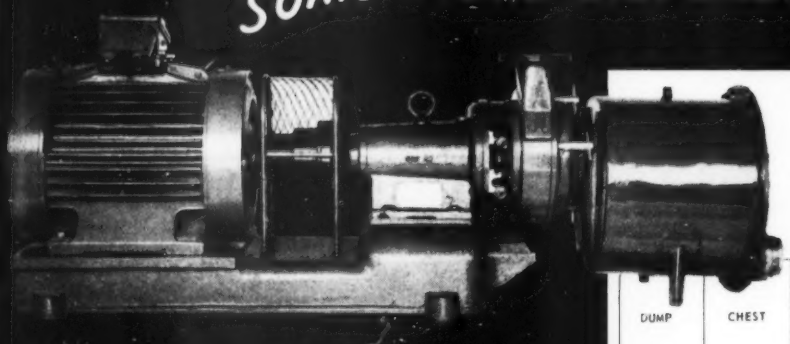
TRONA *American Potash & Chemical Corporation*

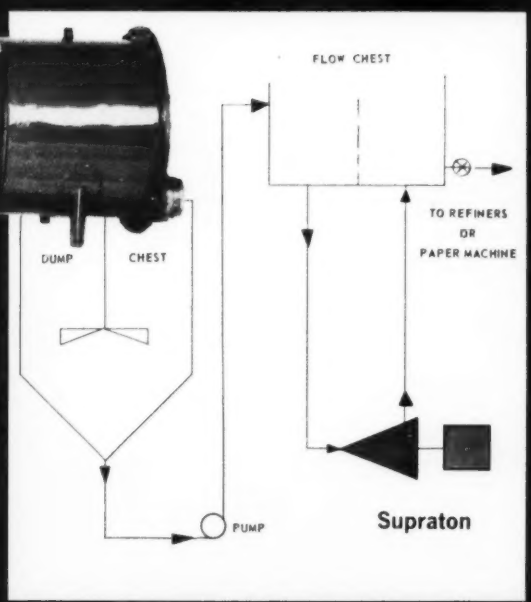
3000 West Sixth Street, Los Angeles 54, California 99 Park Avenue, New York 16, New York

For more data circle 105 on Post Card

SUPRATON

SONIC FIBRE DISPERSION UNIT





- Disperses fibres without affecting freeness of stock or fibre length
- Increases pulping capacity
- Can partially or totally replace refiners
- Improves sheet formation
- Reduces tendency to flocculate

DISTRIBUTED IN THE U. S.*
BY THE MANUFACTURERS OF

Nichols Freeman

VORJECT® Cleaners

VORVAC® Separators

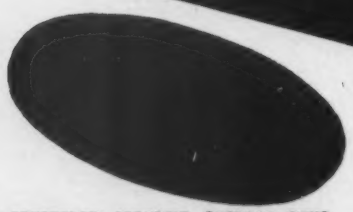
VORTRAP® Classifiers

The Supraton sonic fibre dispersion unit is a compact, low power consumption unit for the complete dispersal of fibres in furnishes of Dried Pulp, Waste Papers, Machine Broke, including Wet Strength and de-inked stocks, without cutting or hydration. Consistency 2%-8%. Capacity: 1500-4000 lbs. per hour. Write for descriptive bulletin.

* Except for the seven Far Western States

NICHOLS
ENGINEERING & RESEARCH CORP.
80 Pine Street, New York 5, New York

For more data circle 106 on Post Card



CRYSTOLON ABRASIVE, REGULAR BOND
REGULAR ALUNDUM ABRASIVE, REGULAR BOND
38 ALUNDUM ABRASIVE, REGULAR BOND
REGULAR ALUNDUM ABRASIVE, G BOND
38 ALUNDUM ABRASIVE, G BOND

One of these Norton pulpstones, with the many grain and grade combinations available in each, is just the right stone for you — a stone that will produce the very best quality pulp from your wood.

You will want the *right* stone to meet the special requirements of your mill. It's just as simple as this. Consult your Norton pulpstone engineer. He will be glad to visit your mill and to study your problem. You can rely on his judgment and experience to recommend the Norton pulpstone which is exactly right for your type of wood, your type of grinder and the type of pulp you want to produce.

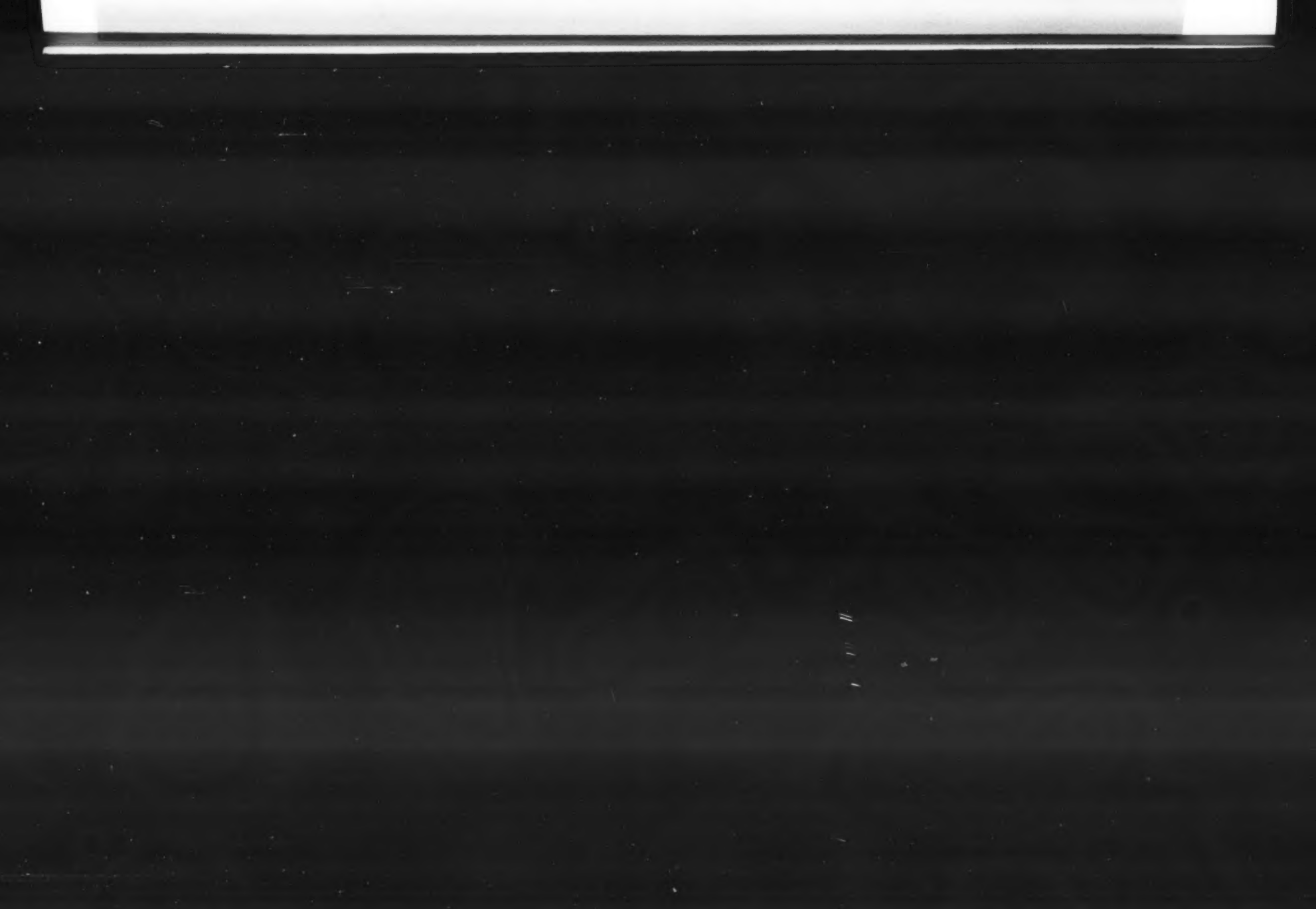
NORTON COMPANY, WORCESTER 6, MASS.
Norton Company of Canada Ltd., Hamilton, Ont.
EXPORT: Norton International Inc., Worcester 6, Mass.

NORTON PULPSTONES *the world's standard for mechanical pulp*

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electro-Chemicals — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

For more data circle 107 on Post Card



How To Keep Inventory Down And Maintain Felt Supply

The Albany Felt Company's **STANDING ORDER PLAN** solves two of the most pressing problems faced by mill operators today.

How to keep inventory down — and how to have the best paper machine felts on hand when needed without desperation orders or costly delays?

Now you can solve both these problems with ALBANY FELT COMPANY'S **Standing Order Plan!** The solution is as near as your Albany Felt Sales Engineer — or your telephone.

Under the **Standing Order Plan,** Albany Felt Company is authorized to ship a specified number of felts — made just for you — at regularly scheduled intervals, based on your anticipated needs. No reorders are necessary for the duration of the agreement.

Albany Felt then schedules manufacture of your felts in time to make certain that shipment dates are met. Since felts to meet your specific requirements are always in process for your future needs, you are constantly protected. Yet, the **Standing Order Plan** is flexible enough to allow for adjustment of inventory by revision of shipping dates.

If you should have an emergency, Albany Felt Company is then in a better position to quickly provide extra felts. On the other hand, if your stockpile should grow, a shipment can be delayed or omitted. Your only responsibility is for felts already woven; this number is small and agreed upon in advance.

Knowing of the protection this plan affords, you can safely reduce the felts carried in your inventory. This reduces storage space requirements and frees funds for other purposes. In addition it saves worry, paper work and possible down-time.

Let your Albany Felt Sales Engineer work out your **Standing Order Plan.** . . . or call today.

TALK **STANDING ORDERS** WITH YOUR

ALBANY FELT SALES ENGINEER

ALBANY FELT
COMPANY
ALBANY, N.Y.

Dedicated to Paper Industry Progress

N. Monmouth, Maine Hoosick Falls, N. Y. St. Stephen, S. C.
Cowansville, Quebec Cuautitlan, Mexico

at Valley we make it
our business to develop equipment
to help you REDUCE YOUR COSTS

Newly designed Valley Portable Roll Header with electrically heated heads. This mobile unit can "head" rolls at any number of locations, thus saving costly roll handling and moving operations. This is another example of a specially designed and engineered piece of equipment to meet the requirements of a customer and to aid in reducing costs.

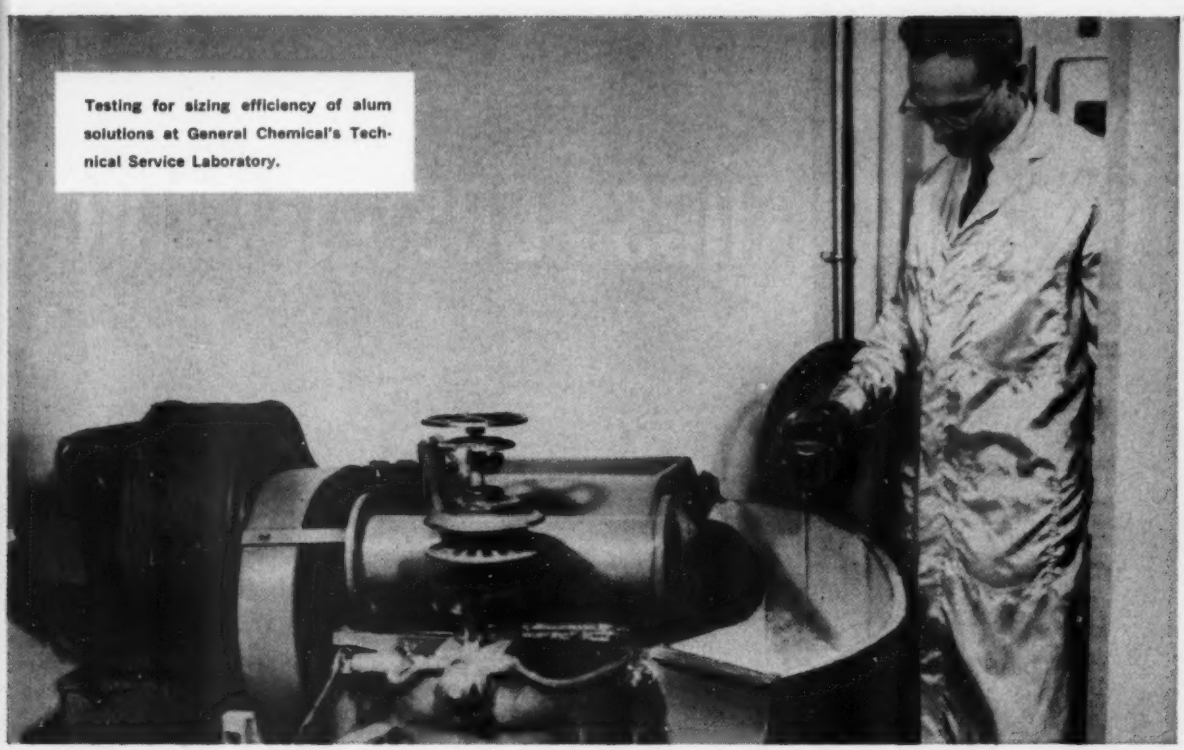
in more and more
finishing departments,
as throughout the paper mill,
it's equipment by. . . .

VALLEY

IRON WORKS CORPORATION
Subsidiary of Allis-Chalmers Manufacturing Co.
Appleton, Wisconsin

West Coast Representative: E. A. Berry, P.O. Box 958, Longview, Washington
Canadian Representative: Pulp and Paper Mill Association Ltd., P.O. Box 850, Station "O", Montreal 9, Quebec

For more data circle 109 on Post Card



Testing for sizing efficiency of alum solutions at General Chemical's Technical Service Laboratory.

Another difference in GENERAL CHEMICAL ALUM is TECHNICAL SERVICE

As the country's primary producer of alum, General Chemical is constantly helping customers solve technical problems involving the use of aluminum sulfate. Results? Improved efficiency and reduced operating costs for them.

Here are some of the services our Technical Service Department offers you:

- Supplying basic information helpful in planning design and installation of storing, pumping, metering and feeding facilities.
- Suggesting improvements to eliminate existing storing and handling problems.
- Providing chemists and operators with physical and chemical data necessary for the most effective use of alum.
- Assisting in laboratory tests and plant trials.
- Running check analyses in our own laboratories.

In the paper mill, our specialists advise on the most efficient use of aluminum sulfate for a particular mill's requirements. They can provide assistance on the important conversion from dry to liquid alum, and furnish guidance on the proper design of new installations and selection of materials to avoid handling or maintenance problems. In many instances, chemical problems arise in operations which are not necessarily related to alum. At such times, General's Technical Service continues to offer helpful advice and lend assistance whenever possible.

This kind of Technical Service is one of the reasons why General Chemical is a good company to do business with for *your* mill's alum requirements. We will welcome the opportunity to serve you.

Basic to America's Progress

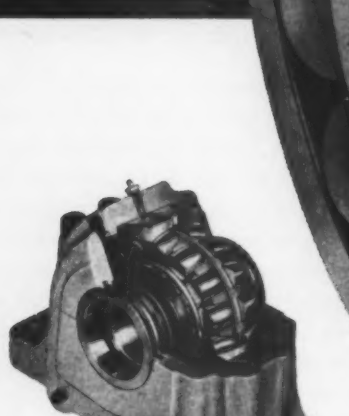
Allied Chemical

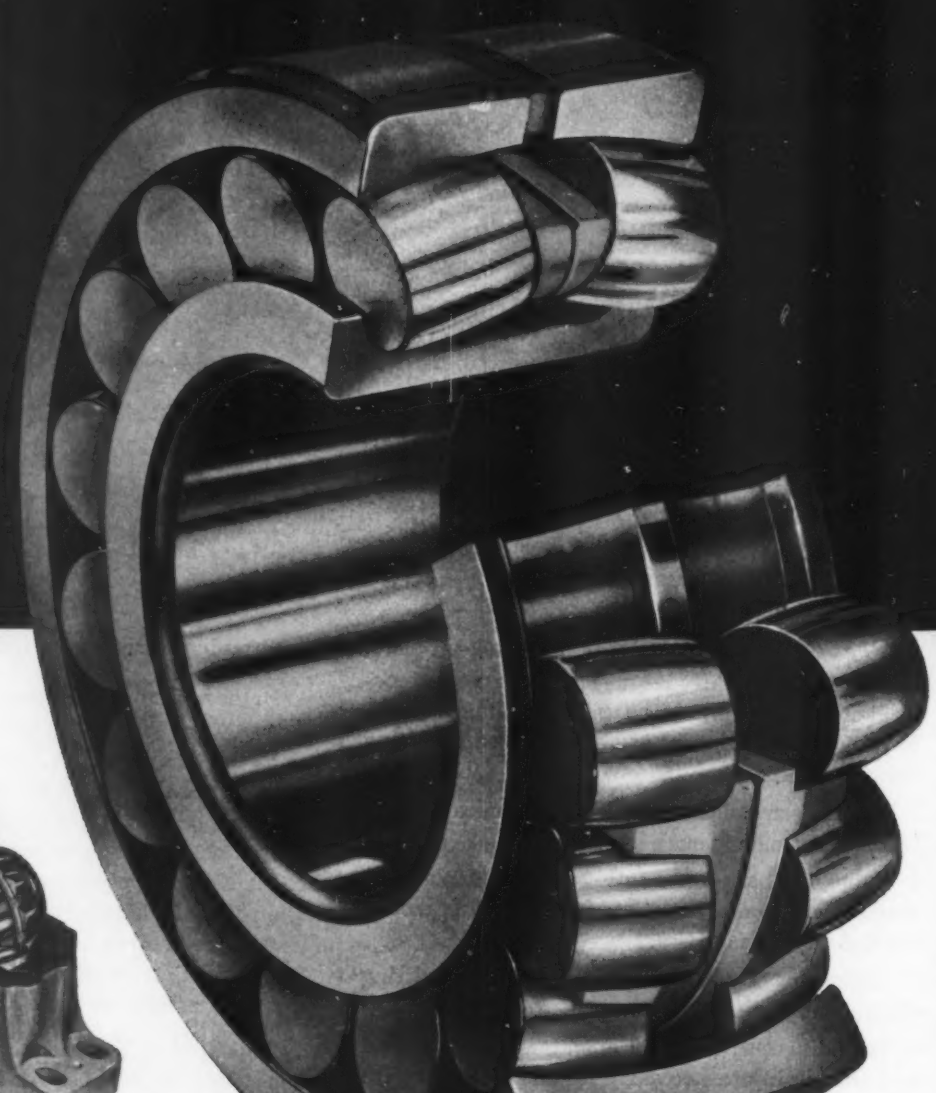
GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

For more data circle 110 on Post Card

LINK-BELT SPHERICAL ROLLER BEARINGS:

measure these design values

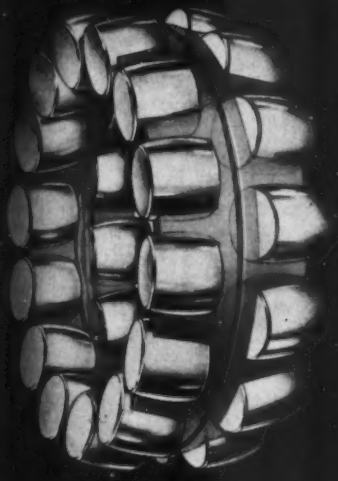




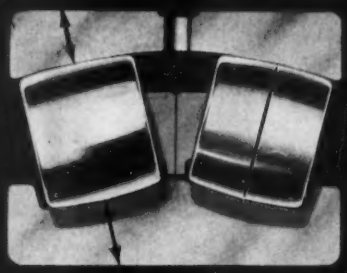
LINK-BELT SPHERICAL ROLLER BEARING PILLOW BLOCKS are available with sturdy gray iron or super-rugged cast steel housings. Two-piece design simplifies mounting . . . permits easy inspection and maintenance without disturbing the shaft position. Link-Belt offers adapter mounting types for shafts from 1 7/16" to 10½" and direct-shaft mounting types for shafts from 1.7717" to 11.0236". Choice of rugged steel, multi-labyrinth seals or Dacron-contact seals.

For more data circle 111 on Post Card

in terms of your applications



SYMMETRICAL ROLLERS
of maximum size and number



BALANCED PROPORTIONS
of all components

WRAP-AROUND RETAINERS
with double-contoured pockets

Check the ratings—compare any size bearing, any make, with its Link-Belt counterpart. Without exception, you'll find Link-Belt's capacity equal to—and more often, greater than—any other spherical roller bearing design. Reason? MORE ROLLERS, LARGER ROLLERS! Link-Belt offers the *largest effective roller complement* for all sizes of spherical roller bearings . . . rated in accordance with accepted formulas of the Anti-Friction Bearing Manufacturers Association. This increase in effective LDN values (roller length, roller diameter and number of rollers) provides longer bearing life.

Ample thickness above and below rollers to handle loads beyond rated capacity. Largest diameter rollers for maximum capacity.

Boosting bearing capacity involves much more than simply increasing the size and number of rollers. Permissible roller size is limited by the relative dimensions of other parts. Not only must retainers and raceways be able to handle the increased capacity—the overall bearing must conform to international standard boundary dimensions. With *balanced proportions design*, Link-Belt spherical roller bearings meet these requirements!

Retainers of Link-Belt sphericals are precision-machined from centrifugally cast bronze. Far stronger than stampings, these husky retainers consist of independently tracking halves. Wrap-around prongs are double-contoured to the exact shape of the rollers. They extend well below the roller centerline for positive guidance . . . well above for maximum retainment. All sharp corners are removed to eliminate the possibility of wiping action between the retainer edges and the rollers. This feature provides for full roller lubrication even during high-speed operations.

FLANGED BLOCKS

FLANGED CARTRIDGE BLOCKS

CARTRIDGE BLOCKS

TAKEUP BLOCKS

SEE BOOK 2760
for further precision, durability and high-capacity features of Link-Belt spherical roller bearings. Contact your nearest Link-Belt office or authorized stock-carrying distributor. Look under BEARINGS in the yellow pages of your phone book.

15.619

ALSO AVAILABLE FROM LINK-BELT'S SELF-ALIGNING ROLLER BEARING LINE
Link-Belt offers roller bearings with solid housings for shafts from ¾" to 4". They're compact, rugged, easy-to-install . . . employ heavy-duty, double-row self-aligning roller bearings. In addition to pillow blocks, the mountings shown above are also available. Ask for Catalog.

LINK-BELT

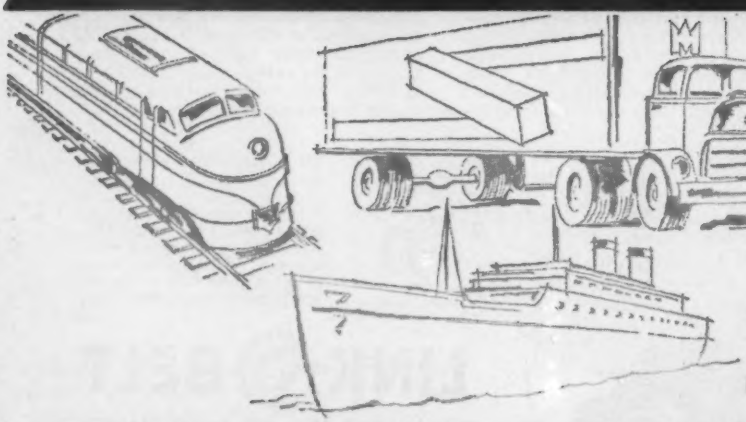
SELF-ALIGNING BALL AND ROLLER BEARINGS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Switzerland, Geneva. Representatives Throughout the World.

For more data circle 111 on Post Card

Buyer's Memo to Himself:

Must have better faster service... Call Marathon



Strategically located sales offices; excellent transportation and shipping facilities by land, water, air or rail; and more than adequate production from manufacturing plants located in the midst of the best timber-producing regions of the country—all guarantee you a dependable source of supply, wherever or whenever needed.

Keep Marathon in mind for pulp, printing papers, paperboard and specialty materials.

Pulp, Paper and Paperboard Department

marathon

A Division of American Can Company

MENASHA, WISCONSIN

A DEPENDABLE SOURCE FOR QUALITY CONVERTING MATERIALS

For more data circle 112 on Post Card

mind your own business

A personal file of stimulating ideas, little-known facts and daily problem solvers.

Ted Pollock

Going to a convention

No need to walk around with your pockets stuffed with literature you receive there and want to read later. Instead, take along some stamped, self-addressed envelopes and mail the material to yourself as it accumulates. When you return home, it will be waiting for you.

To get things done—start 'em!

One of the biggest stumbling blocks to achievement: *getting in debt to yesterday*, the inevitable result of postponing a task.

To avoid this costly procrastination, use reverse strategy: *start tomorrow's job today*. In the morning, you will get a psychological lift from finding the task already begun, be better prepared to plunge right in and finish it.

Actually, you will be taking advantage of a well-known psychological fact: our memory for uncompleted tasks, sparked by the unresolved tensions they create, is 10 times greater than our memory for completed ones. When you leave a job unfinished, your subconscious—that silent ally always on duty—goes to work on it. Later, when you return to the job, you are often amazed to discover that you have a whole new arsenal of ideas, insights and solutions to draw from.

Try this mental exercise

Can you **really** see the other fellow's point of view? Here's a simple test to help you exercise you "tolerance muscle." In the following space, jot down an idea or principle that you believe in deeply:

_____

_____

_____

Got it? Now write out three arguments **against** it.

How to give instructions—effectively

Whether it's breaking in a beginner or explaining a new procedure to an old hand, at one time or another we are all required to be teachers. If you want your instructions to "take", try this proven, six-step formula.

1. **Lead from the known to the unknown.** People learn best when they begin with the familiar, then gradually move on to the new.

2. **Move from the simple to the complex.** As we learn something new, confidence in our ability to learn still more increases. Hence, it's a good idea to begin with material your "student" can easily grasp, gradually introduce more difficult instruction.

3. **Keep it positive.** The mind is a tricky mechanism. Tell it **not** to do something and in the process of trying to remember the prohibition, it may tense the very muscles that should be relaxed. Thus, if you say, "Miss Jones, don't mail this letter before 5 o'clock", it's even money that Miss Jones' brain will erroneously associate the phrase before 5 o'clock with mailing the letter. Far better to keep your instructions positive and say, "Miss Jones, mail this letter after 5 o'clock".

4. **Demonstrate.** Psychologists estimate that 85 per cent of everything we know is learned through our eyes, only 10 per cent through our ears. That's why verbal instruction accompanied by demonstration are so much more effective than verbal instructions alone. Whenever possible, therefore, demonstrate your instructions and have your "student" imitate your performance. If demonstration is not possible, introduce "eye-appeal" with charts, models, drawings, diagrams, written instructions and so on.

5. **Encourage questions.** Be suspicious if there are no questions after you have given instructions. If necessary, turn interrogator yourself: ask questions designed to flush out misunderstanding or misinterpretation. Keep asking them until you are convinced that your message has been understood.

6. **Check on progress.** This doesn't mean breathing down a man's neck every minute of the day and making him feel like the village idiot. It does mean dropping by or telephoning from time to time to find out how things are going and ask whether you can be of any further aid. A good time, too, to hand out an encouraging pat on the back wherever justified.

Three recent discoveries that can make you more efficient

Want to get more things done—faster? Research has uncovered some fascinating ways and means.

- Experiments at the Max Planck Institute indicate that, in an 8-hr. day, three spaced 5-min. coffee breaks are more beneficial than one 15-min. break. Reason: the first 5 min. of a rest period give the most relaxation.
- Long Island University researches have found that most people are more alert on their feet than when sitting down. Pacing back and forth can help you think better.
- Carefully controlled experiments show that, in the execution of physical labor, grunting and groaning on the job can actually increase your strength by as much as 5 per cent!

End pitch rejects with low-cost Celite Fillers

For nearly thirty years, paper manufacturers have been successfully relying on Celite® diatomite fillers to eliminate costly pitch problems.

With a porosity as high as 95% and the ability to absorb up to three times its weight in liquid, Celite effectively absorbs and coats the pitch particles. Because Celite's particles will not adhere to each other, the build-up of pitch agglomerates is prevented. Due to the fine size and large surface area of its particles, you need add only 1 to 2% of Celite.

Celite can also be put to work to increase opacity and brightness, replace TiO_2 pigments and to provide better ink receptivity and absorption. It is little wonder that this low-cost filler plays so important a part in the paper industry. For full information, write Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario. Cable address: Johnmanvil.

Celite Division inert fillers and extender pigments in paper are not considered food additives as defined by FD&C Act Amended, Section 201(s).

JOHNS-MANVILLE JM

For more data circle 113 on Post Card

TO UP-GRADE PRODUCTION

CALL BAUER

Cleaner stock... CENTRI-CLEANERS	Improved fiberizing of chips, higher machine speeds... DOUBLE REVOLVING DISC REFINERS	Continuous or rapid cycle cooking and impregnation... DIGESTERS	Final stock preparation ...PUMP THROUGH REFINERS	Liquor removal... PRESSAFINERS	Automated high yield systems ...BAUERITE

THE Bauer BROS. CO.

Springfield, Ohio

IN CANADA: THE BAUER BROS. CO. (CANADA) LTD.

Brantford, Ontario

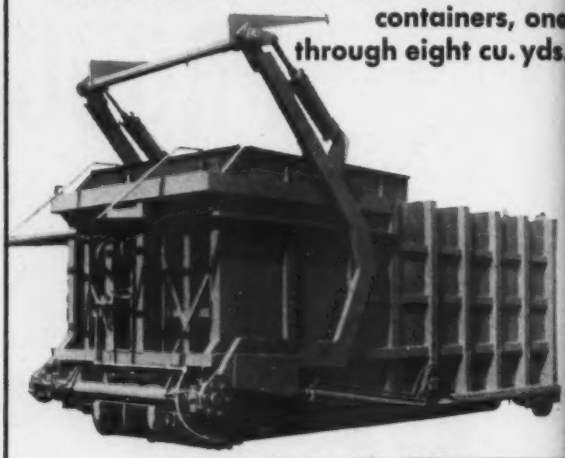
For more data circle 114 on Post Card

For Materials Handling or Refuse Collection

DINOSAUR + DINOMASTER

Handles (in addition to DINOMASTER) containers eight through 40 cu. yd. capacity and over

When mounted on DINOSAUR, provides "No-Container-Haul" Service for refuse containers, one through eight cu. yds.



Besides serving DINOMASTER, the DINOSAUR picks up huge loads in big capacity containers . . .

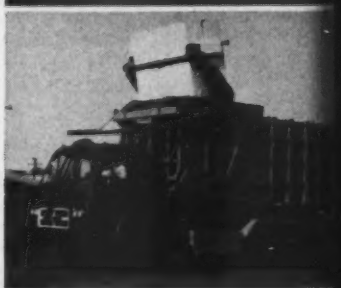
DINOSAUR picks up DINOMASTER hydraulically for refuse container service.

extremely heavy materials in smaller containers . . .

DINOMASTER engages loaded container and lifts it into emptying position.

. . . and can even handle two containers at a time for additional flexibility.

Contents fall into body where up to 85,000 lb.* pressure packer plate compresses material to a fraction of its former volume.



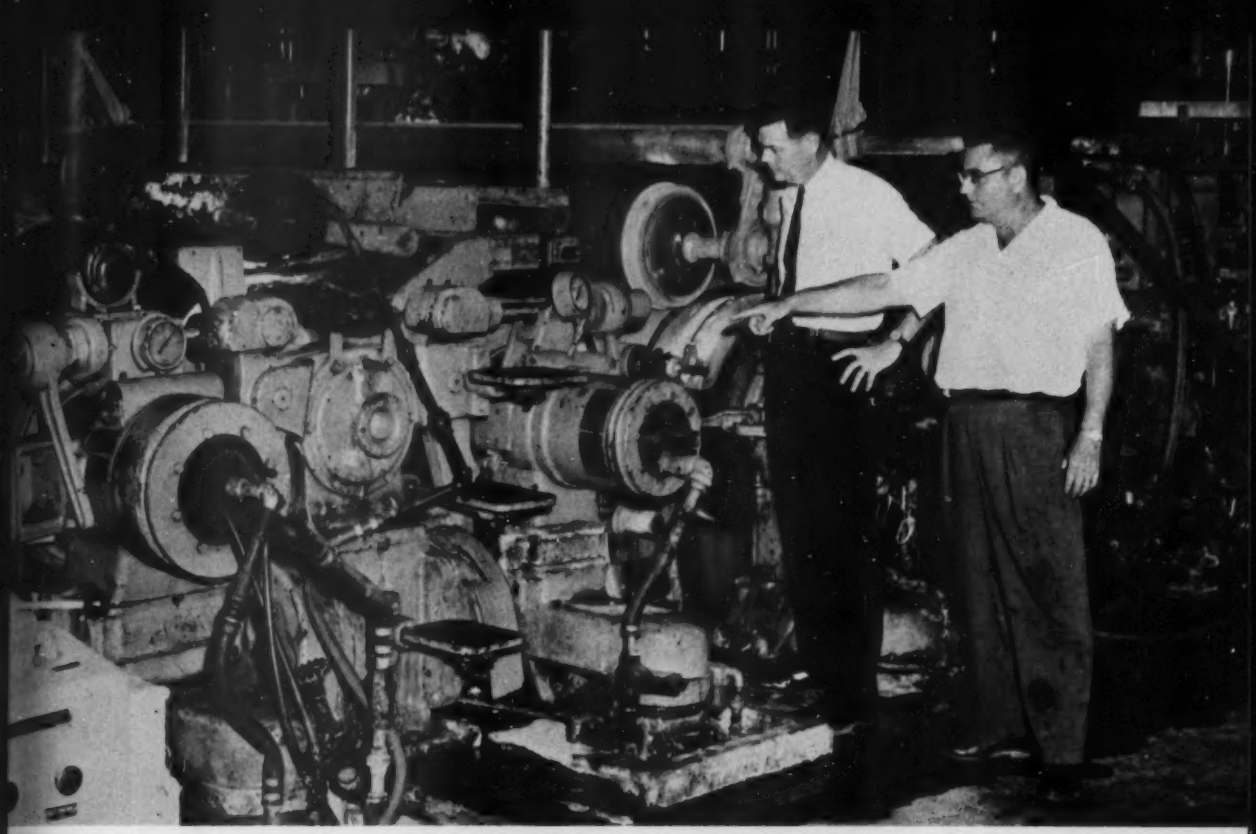
*On 30 yd. Model

Mfd. Only By
DEMPSTER BROTHERS
Inc.
Dept. PI-4 KNOXVILLE 17, TENNESSEE

PART OF THE
DEMPSTER DUMPSTER® SYSTEMS

WRITE TODAY FOR COMPLETE INFORMATION

For more data circle 115 on Post Card



L to R James W. Clark, Huyck Sales Engineer and C. A. (Buck) Barlow, Paper Mill Superintendent

HIGH Performance from HUYCK

at Gulf States Paper Corporation

Here is testimony to the fact that Huyck Felts cost less over the "long run."

At Gulf States Paper Corporation, Tuscaloosa, Alabama, a Huyck Felt, incorporating the improved performance characteristics of Resistex® Felts, set an all-time mill record. An excellent startup and consistent high product quality were outstanding features of the record run.

Why not let your Man from Huyck show you how Huyck Performance is High Performance on your machine.

HUYCK FELTS

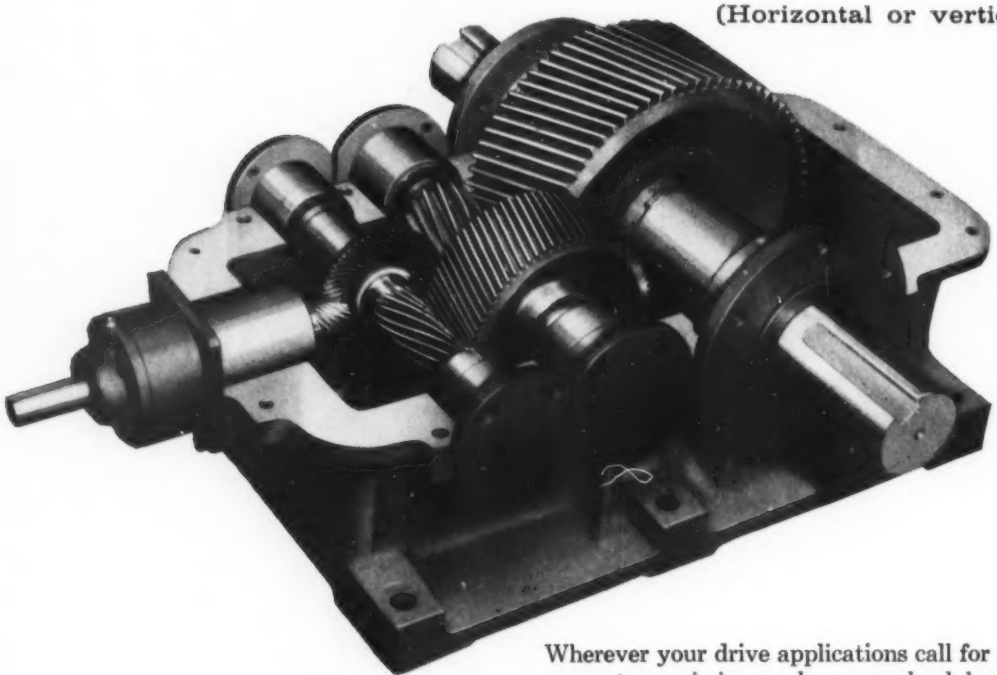
Huyck Felt Co., Rensselaer, N. Y.; Aliceville, Ala. Division of Huyck Corporation

In Canada: Kenwood Mills Limited, Arnprior, Ontario

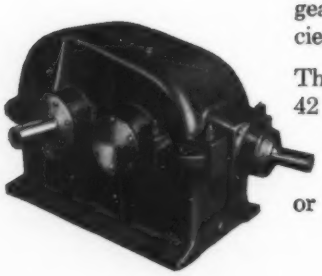
FIRST IN FELTS SINCE 1870

for economy plus efficiency, use spiral bevel-helical reducers on your heavy drive applications

(Horizontal or vertical type)



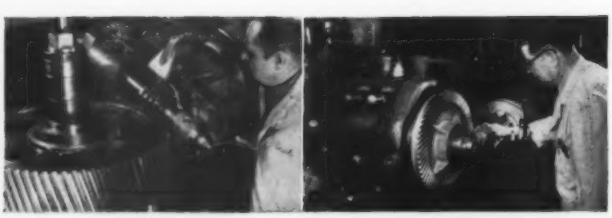
Wherever your drive applications call for right-angle power transmission . . . heavy or shock loads . . . high reduction ratios . . . continuous operation, D. O. James *spiral bevel-helical* reducers are the answer. They provide economy of initial cost, economy of maintenance, and economy of operation. The very high efficiencies of spiral bevel gears and helical gears combine to provide an over-all reducer efficiency in the range of 95%.



These D. O. James reducers are manufactured in 42 standard sizes, .2 to 637 hp, 6:1 to 358:1 ratios.

For complete specifications and selection data, call your local D. O. James representative or write for Catalog No. 43-AA.

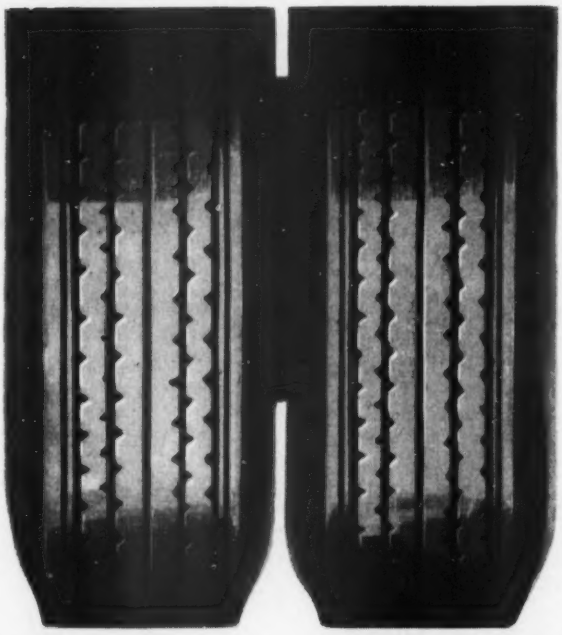
D. O. JAMES GEAR MANUFACTURING CO.
1140 West Monroe Street, Chicago 7, Illinois
Since 1888, every type of gear and gear speed reducer



D.O.James

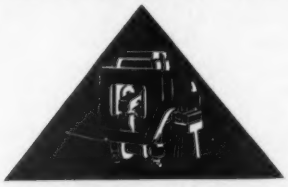
...where you always get good gearing

For more data circle 117 on Post Card



UP PROFITS BY ENDING WEIGHT ERRORS!

FAIRBANKS-MORSE TYPE "S" TRUCK SCALES



Good weighing builds good will—and bigger profits.

Our exclusive Type "S" Truck Scales are famous for accuracy, low maintenance, best load distribution, and minimum installation requirements. They provide greater protection to pivots and bearings under massive loads and sudden stops.

Each Fairbanks-Morse Type "S" Truck Scale is extremely accurate. High-tensile-cast, one piece levers prevent warping, failure, corrosion due to damp scale pits. Exclusive Type "S" design provides super strength, better weight transmission, and protection for sharp knife edges. All parts, including pivots and bearings, are completely interchangeable.

Each Fairbanks-Morse Type "S" Truck Scale is expandable —for longer trucks and larger payloads.

You have a choice of indicators, either Beam type—or our exclusive, swiveling "Floaxial" Dial for fully automatic read-outs!

F-M Type "S" Truck Scales range in capacities from 10 to 100 tons and higher. Platform sizes from 18' x 9' up to any size required for the weighing of vehicles according to legal limits. Optional accessories include: double face dial; Printomatic for accurate, trouble-free weight recording; and type-registering weighbeam, etc.

For further information, write: **C. G. Gehringer; Scale Division; Fairbanks, Morse & Co.; 19-01 Route 208; Fair Lawn, New Jersey.**

FAIRBANKS MORSE

A MAJOR INDUSTRIAL COMPONENT OF

FAIRBANKS WHITNEY

For more data circle 118 on Post Card

RHEOLOGY OF PAPER COATINGS

R. A. DIEHM
Professor of Paper Technology
Western Michigan University

Part IV – Pigment flocculation and deflocculation

PIGMENTED coating mixtures are such complex rheological systems that it is rarely possible to predict the behavior of the coating mixture ingredients in the presence of each other until the mixture is made and flow properties determined. Since a coating mixture for a modern coating machine running at high speeds has a greater amount of pigment than any other ingredient, it is logical that the state of the pigment in the coating mixture should be studied thoroughly.

The first consideration of the rheologist is the degree of flocculation of the pigment. Both chemical and physical forces exert different influences as the flocculation or deflocculation of the pigments vary. These forces permit the establishment of structures in some cases while in others they make structure formation impossible.

One could hardly expect that the mechanisms for flocculation and deflocculation of all the pigments would be the same, yet there are some features rather common to all. As one searches the literature for information on these mechanisms, one finds material about in proportion to the relative tonnages of the pigments used or the length of time the pigments have been used in the paper industry.

It is to be expected, therefore, that much has been written about the dispersion and flocculation of coating clays. This is not only true, but much of the knowledge developed in clay deflocculation can also be applied to the deflocculation of other common coating pigments.

Chemical forces involved in deflocculation

Clay is a kaolinite crystal built up of alternate layers of silica and alumina which are bonded together through oxygen and hydroxyl linkages (1). The hydroxyl is the weaker bond of the two and its bond to the silica forms a natural cleavage plane in clay particles. This permits the clay particle to separate into crystals or plates. These crystals can become hexagonal only if there are fractures roughly perpendicular to the natural cleavage planes.

Such fractures break the stronger oxygen linkages and expose surfaces active in base exchange properties. These surfaces preferentially absorb hydroxyl ions which carry with them water molecules of hydration. They surround the particle with a water hull which is held very tightly to the particle. This water layer has been called a "diffuse double layer".

The hydroxyl ions attached to the reactive clay surface give the clay particle a negative charge which extends through the water layer surrounding the particle. It needs to absorb positive charges from its surrounding medium to balance the electrical charge of the particle. Since the positive charges decrease in density as the distance from the particle becomes greater, there will be some point at some distance from the particle where the charge will equal zero.

When most or all of these positive charges consist of hydrogen, many of the ions will be in or very near the water layer. With the zero point of such a system relatively close to the particle, the charge of the particle approaches zero and cannot exert much of a repelling action upon another similar particle. The particles then are in a state of flocculation because there are some forces of attraction to hold the particles together.

The base exchange reactions of clay have been given (1) as follows:

(1) Clay OH-H + NaOH = Clay OH-Na + H_2O
(2) 2 Clay OH-H + Na_2SiO_3 = 2 Clay OH-Na + H_2SiO_3
(3) Clay OH-H + NaCl = Clay OH-Na + HCl

A sodium clay is formed in each of the above reactions. A slight excess of the strong base or the basic salt in the first two reactions would lead to deflocculation, but this is not the case with the neutral salt in the last equation because of the formation of hydrochloric acid which would contribute hydrogen ions to the system.

When deflocculation is obtained as noted above, the hydrogen ions are replaced with sodium ions which are more highly hydrated than the hydrogen ions, thereby increasing the thickness of the water layer. The greater hydrated ions outside the water layer are held more loosely than are hydrogen ions which pushes the neutral point of the system farther away from the particle. The difference in concentration of the hydroxyls on the reactive surface and the loosely held

positive ions gives the particle a strong electrical charge so that it will repel other similarly charged particles, setting up a state of deflocculation.

The acid produced in the last reaction given seems to be the only explanation why alkaline salts deflocculate and why neutral salts flocculate. This agrees with the observation that complete dispersion is possible only when the continuous phase carries the same ions which are preferentially absorbed on the particle surface.

As more and more of the alkaline salts are added to the clay-water system, the concentration of sodium ions in the system will become great enough to force some of these ions into the water layer where they will set up a neutralizing effect upon the preferentially absorbed hydroxyl ions, thereby reducing the magnitude of the negative charge on the particle. One would expect, therefore, that the viscosity of the clay dispersion would decrease until the sodium ions are forced into the water layer, after which there would be an increase in viscosity in proportion to the number of hydroxyl ions neutralized. If this were carried far enough, flocculation would occur.

There is also the possibility that negative ions other than hydroxyl could be absorbed on the surface of the clay particle if they were present in sufficient quantities to permit mass action to play a role. It is believed that such absorption would follow the Hoffmeister series, the important ones in the coating industry being in the order of SO_4, NO_3, Cl, and OH in which the greatest stability of the dispersion would be found with the hydroxyl. If sufficient numbers of the other ions were present to replace the hydroxyl ions, the end result would be the same as pictured above with the neutral salt.

So much has been written about the sodium alkalis in dispersion because they are used so extensively in the paper coating industry. Lithium and potassium alkalis could be used except for the economic aspect. The degree of hydration of these ions pushes the neutral point to sufficiently great distances from the particle surface to give good deflocculation. As the valence of the positive ions increases, this distance becomes smaller. Hydrogen is the exception, and it has a shorter distance than even the trivalent aluminum. It is for these reasons that the best dispersing agents are of monovalent positive ions with large hydration spheres in a water medium containing hydroxyl groups by which the clay particle is surrounded.

Role of mechanical energy in deflocculation

The foregoing discussion deals with the chemical forces involved in the deflocculation of pigments, and while it is of extreme importance, other factors must be considered. One of these is the mechanical energy applied to the system during the deflocculation process.

The deformation of some pigment particles is exceedingly small, but there is a reduction of the size of the aggregate. The small compact crystals may show very little breakdown. Long needle shaped crystals may be shortened. Mechanical dispersion holds the pigment particles apart only as long as the mechanical energy is applied to the system. Consequently, it is of extreme importance to use mechanical energy along with chemical energy to make a permanently deflocculated pigment suspension.

The differences in the composition of particle size and particle shape determines the viscosity of a concentrated clay dispersion. Any change in shape caused by breaking across needle or platelike crystals (2) while increasing fineness might be expected to reduce the viscosity of highly concentrated pigment suspensions. When the fine particles of a naturally viscous clay are removed, the viscosity may decrease. In some free flowing clays, the viscosity may increase as the fine particles are removed. In such cases the viscosity can be lowered by returning the fine particles or by further fractionation to remove coarser particles.

Grinding or shearing clays in dilute suspensions do not alter the particle size or shape to any appreciable extent. One of the most practical methods of changing the particle size and shape is the application of mechanical energy to a clay in a system having a putty-like consistency. This modifies the clay particles to smaller sizes with a greater ratio of thickness to length. Such particles will pack more closely when suspended in water.

It is believed (2) that thin, long, clay plates produce the highest viscosity. If this is the case, then the production of clay platelets with greater ratios of thickness to length should give lower viscosity. Since this has been demonstrated, the use of high shear in the chemical dispersion procedure should give clay dispersions of the lowest viscosity possible.

The reduction of the particle size and shape alteration due to intense mechanical working would no doubt affect the free liquid (3) which is not tied up by the suspended particles. In this regard, the viscosity would be proportional to the volume concentration of the pigment, but inversely proportional to the amount of free liquid. It is probably for these reasons that "a good dispersion can be considered as the result of the reduction in size of the aggregates by mechanical means together with the presence of a deflocculating, surface active material known as a dispersant or a dispersing agent" (4).

Glassy phosphates as dispersing agents

In considering the mechanism of deflocculation as described above, it appears as if sodium hydroxide would be the ideal dispersant because it would serve as a source of hydroxyl ions and of the highly hydrated sodium ions. This would probably be true if one dispersed a pure kaolin in distilled water. Coating clays have enough foreign substances and most mill waters have some hardness which reduce the effectiveness of the sodium hyroxide. It is for this reason that the dispersing agents most commonly used are the glassy phosphates, such as sodium hexametaphosphate, tetrasodium pyrophosphate, and sodium tetraphosphate. These are used because they have the ability to sequester divalent and polyvalent ions which would interfere with the deflocculation process (4). The deflocculation of clays in hard waters always requires more polyphosphates than is the case with waters of lesser hardness.

There is not perfect agreement among the various investigators on the mechanism of pigment deflocculation because of variations noted in this process. Thus, it has been stated (6) that neither the action of exchangeable cations nor hydroxyl ions are the direct cause of deflocculation, but that the effectiveness of a deflocculant increases as its anionic charge increases. The anions are said to form complexes with surface silicon and aluminum ions of the clay in the interfacial areas where chemisorption takes place.

The work reported to date on this mechanism is not as conclusive as that supporting the mechanism

which requires hydroxyl groups for deflocculation. Furthermore, commercial handling of the pigments in the coating mill also supports very strongly the activity of the hydroxyl ions. It should be emphasized that this applies not only to clay deflocculation, but also to most inorganic pigments used in paper coatings. While the great bulk of this work has been reported for clays, it is generally admitted among pigment suppliers that the mechanisms for the deflocculation of other pigments follow the same principles.

Deflocculation of calcium carbonate

The glassy phosphates have been found to deflocculate calcium carbonate very well (7). Mechanical energy is extremely necessary to assist the chemicals to give low viscosity dispersions of calcium carbonate. While clay suspensions build up in viscosity gradually as the solids are increased, this is not always true in calcium carbonate dispersions. In the latter, as the solids are increased, the slurry becomes very viscous when polyphosphates are used as the deflocculant. As further mechanical energy is applied to the slurry, the viscosity will decrease suddenly, and it can then be built up again by increasing the solids content of the suspensions to 70 per cent pigment concentration.

Calcium carbonate can be deflocculated with a number of dispersants, both inorganic and organic. In all cases, the phosphates give the lowest viscosity or the highest possible pigment concentration or both. Regardless of the nature of the deflocculant, the best dispersions are obtained when the particles are subjected to high shear by the mechanical treatment of high solids slurries. Kneaders have been found to be particularly effective.

This is probably due to the reduction of the particle aggregates in size as the mechanical energy is applied to the concentrated slurry. The original aggregate occupied a greater volume than that of the ultimate particle and the reduction of size of the aggregate reduces the void volume so that the liquid in the system fills the reduced voids to make it more free-flowing. Thus it appears as if reducing the particle aggregate size without altering the amount of water or the addition of water without altering the particle size both have the same effect in calcium carbonate slurries.

Slurries of calcium carbonate made up in high pigment concentration and diluted show lower viscosities than slurries made up to similar concentrations without dilution. This decrease is most pronounced if the original concentrations are above 60 per cent.

Deflocculation of titanium dioxide and satin white

Titanium dioxide pigments are available to the coating technician as water dispersible (anatase) and oil dispersible (rutile) forms. The rutile forms are deflocculated in systems containing a small amount of alkali (4) into highly concentrated slurries. Some forms of the water dispersible types of titanium dioxide disperse less readily in the presence of an alkali. The effects of deflocculating agents have been variable because of differences in their preparation. Sodium hexametaphosphate is quite effective with the rutile form.

Dispersion of the titanium dioxide pigments in paper coatings has not been a problem, not only because they disperse rather easily, but because they compose the minor part of the pigment mixture in coatings in which titanium dioxide is used. Since titanium dioxide is usually used with clay, there is no dispersion problem because both are deflocculated by the glassy phosphates. The same thing might be said about most of the high strength white pigments.

Satin white is usually made in the mill using it. Since it is handled wet until dried on the paper, any mechanical action performed on the particles must be done in the wet state. It has been customary to treat satin white in ball or pebble mills and to add a protective colloid in order to make a homogeneous dispersion.

"Protein shock" effect on deflocculated pigments

Since the application of every coating requires it to flow more or less freely at the point of application or smoothing under various degrees of shear, the pigment is usually deflocculated to the lowest possible viscosity before mixing it with the adhesives and other ingredients of the coating mixture. There are numerous conditions which alter the state of deflocculation or flocculation of the pigment. One of these treatment (4) has been called "protein shock". When this occurs, the deflocculated pigment particles are flocculated and agglomerated by the addition of the adhesive.

The term "shock" has been used frequently to describe this phenomenon because the adhesive is added too rapidly to permit the formation of a homogeneous mixture. If the problem is only one of improper mixing, the protein shock can be overcome by prolonged agitation and shear. If the shock is due to the sharing of the dispersant by the particle and the adhesive, then more dispersant must be added along with the prolonged agitation to restore the desired flow properties of the system. Unfortunately, there are cases where neither agitation alone or in combination with more dispersant will restore the flow properties of the original pigment suspension.

In the free flowing low solids coating mixtures the initial deflocculation of the pigments is preserved in the coating mixture as applied to the paper. As the pigment concentration is increased, the particles and adhesive molecules must share the water which is becoming more and more a limiting factor. This is accompanied by a concentration of all other ingredients in the coating mixture. As this occurs, at least some of the particles flocculate which is necessary for some coatings.. This will be considered more carefully in the rheology of coating mixtures.

It should be kept in mind that there must be some order in the treatment of the pigment during dispersion. In the first place, it is necessary to have the proper amount of dispersing agent present. Then there must be sufficient mechanical action to bring the particles in contact with the dispersant. If very high shear between particles is necessary and if the mechanical equipment is very rugged, then dilatancy is desirable until the proper shearing action is obtained. After shearing, the dilatant system can be made free flowing by the addition of a small amount of water.

LITERATURE CITED

1. Asdell, B. K.—The dispersion of coating clays. Paper Mill News. May 31, 1947.
2. Millman, N.—Viscosity control of concentrated clay suspensions. Paper Trade Journal. Feb. 16, 1951.
3. Mattson, V. F. and Leighton, J. R.—Progress report on an investigation of the fundamental factors determining coating color viscosities. Tappi 42. No. 1. Jan. 1959.
4. Willets, W. R. and Georgevits, L. E.—Some aspects of dispersion. Tappi 38. No. 10. Oct. 1955.
5. Albert, C. G.—Particle structure and flow properties of coating clays. Tappi 34. No. 10. Oct. 1951.
6. Van Wazer, J. R. and Besmertnuk, Evelyn J. Journ—Physical and Colloid Chem. 54. 99-106. 1950.
7. Leal, C. W. and Liggett, L. M.—Aqueous dispersions of calcium carbonate. Tappi 38. No. 3. March 1956.

AUTOMATION IN FINISHING, SHIPPING AND CONVERTING*

JESSE P. RAMBO

Assistant Superintendent
Finishing & Shipping Departments
St. Regis Paper Co., Pensacola, Florida

THE first steps toward automation in the finishing, shipping and converting departments became noticeable in the early 40's.

We notice first the elimination of the collapsible shaft. Paperboard cores came into use and a much lighter shaft was sufficient. However, we still had the problem of wedging the rolls apart at the slit, and cutting of the paperboard core with an oversize hand saw.

We note, too, a most significant change in the winder table. The automatic hydraulic table came into use. Thereby it was possible to lower the set of rolls to any given position, thus permitting the shaft to be removed from the set with considerable ease. Then, the table was lowered to floor level and the entire set rolled off on the finishing floor. Also, the large glue machines for gluing the heads were put into operation, thereby eliminating the use of mop and hand operation. Immediately following this, the automatic head press (header) came into operation. The automatic header eliminated the up-ending of rolls and the pressing-on of heads by hand. So in this ten-year span, roll finishing made its first move from a strenuous job to a more simple and speedy operation.

Changing methods (1950-1960)

The past decade brought the most revolutionary methods into the finishing department, in a gigantic step toward almost complete automation. The shaft is no longer removed from the set of paper by hand. The set is ejected from the winder onto a "shaft stripper" or "roll stripper", and the entire set is stripped from the shaft by a conveyor. The set then rolls off on a ramp which has a very gradual drop. On this ramp, hydraulic stops at intervals separate the rolls as the set slowly moves to the finishing-room conveyor. So, the old method of pulling the shaft, cutting the cores and maneuvering the rolls into position on the finishing floor has been eliminated. The winder table and the delivery of the rolls to the finishing floor is now completely automatic. As the rolls come from the paper-machine winder onto a conveyor, they are conveyed into position and injected into an automatic roll header and scales which press on the glued heads and weigh the roll in one operation.

Next, the roll is automatically ejected onto a conveyor which conveys it to any one of a number of shipping docks and automatic turntables. If a roll requires steel strapping on each end, an automatic strapping machine is located between the wrapping machine and the scales. This automatic strapping machine straps each end of a roll at any desired distance from either end.

The shipping department also has seen some significant changes in the last 10 years. We now have a conveying system which will deliver the rolls of paper from roll finishing to a given shipping dock. Here, we find automatic up-enders — a great time-saver in picking the rolls up for loading -- also rotating roll clamps on lift trucks for loading rolls on end.

By going to end loading, we reduced our damage claim to a minimum and also greatly reduced freight cost. We moved from timber-type bracing to metal strap bracing — reducing damaged paper claims and material cost. Now we have moved into inflatable dunnage for bracing carloads of paper. This method appears to be the best in the paper industry to date since, through its use, shipments arrive at their destination in the very best condition.

Converting

Automation in the converting department is a must if top efficiency is to be expected.

We are proud of the latest progress made in our company's converting department. For instance, the sheet cutter is now equipped with an automatic sheet counter which will count any desired number of sheets. Then, we have an automatic box let down, an overlapping layboy, a variable speed drive, a Mount Hope roll, and split double-edge blades for a speedy, efficient operation. Changing the sheet size on the swing knife has been greatly simplified by the use of timing belt pulley drives in place of the various size gears. This has reduced down time considerably. In addition, we are able to increase or decrease speed with very little, if any, variation in length of sheet. We now have automatic lift tables at the trimmer and tying tables. This greatly reduces fatigue and increases efficiency. The rewinder and counter roll operation has moved to an almost complete automatic operation. The backstand is automatically loaded. It has automatic alignment of sheet, automatic tension roll, and automatic stop on various diameters. The set of rolls is automatically ejected. The shaft stripper automatically takes the rolls from the air-loaded shaft onto a conveyor to the wrapping table or automatic counter roll-wrapping machine. All jumbo rolls for the converting department are delivered to the backstands by conveyor.

Automation has moved in at a very fast rate. This is the answer to many of our problems in industry today. Over the past 30 years, finishing and shipping of paper has moved from a back-breaking, man-killer operation into a speedy, simple and safe operation by means of automation.

Taking into consideration the greatly increased production from paper machines, it is imperative that we press for as near complete automation as possible in the finishing and shipping departments. Continued progress in the field of automation most certainly will eliminate the remaining bottle necks in these departments.

*Abridged from a paper presented at a PIMA Meeting in Williamsburg, Virginia, October, 1960.

CLARIFIERS SOLVE EFFLUENT PROBLEMS

LEO WALTER
Consulting Engineer

THE CHOICE of a suitable clarifier design for effluents from paper mills is not always easy. After investigation of possibilities for re-use of solids or parts of liquids, the quality of recoverable sludge or slurry has to be investigated. Local conditions have to be considered for alternative discharge into a river, or into a sewage system. Whether treatment of effluent is required depends on regulations; where permissible, the right type of clarifier will solve the problem without further effluent treatment.

How to deal with sludge, again depends on working conditions. If not recoverable, the sludge can either be disposed of wet, or it may be advantageous to dry it before disposal. The majority of mill effluents requires chemicals for coagulation when using a clarifier. This separates suspended solid particles and organic substances from the water. The choice of coagulants will not be discussed here.

Clarifiers can be divided roughly into six different types —

(a) Horizontal flow
(b) Cross flow
(c) Vertical flow
(d) Spiral flow
(e) Vertical flow with sludge accretion
(f) Vertical flow with or without sludge accretion using aeration

Horizontal flow clarifier

The horizontal flow or canal-type of clarifier is used where very large quantities of effluent or water are being treated and is also useful for primary clarification. A typical horizontal flow tank is fitted with mechanically driven chain flights for removal of heavy solids from an effluent and for the removal of any flotation elements in the effluent such as oil or scum. The flights are electrically driven, the lower flights delivering the settled sludge into a hopper or endless belt for collection and disposal, while the upper flights aid the flowing of the scum into an adjustable skimming weir at the far end of the tank for discharge into a separate chamber. The effluent to be treated enters at one end of the tank through a distributor extending across the width of the tank and is collected in a similar manner at the far end. This type of clarifier can be provided with preliminary flocculators and aerating devices, if desired.

Cross-flow clarifier

One example is the familiar rectangular baffled tank with ridge and valley or multi-hopper floor construction for sludge removal. Many of these tanks have been used in past years: they are simple to construct and lend themselves to mass concrete or brick construction when other building facilities are not available. They are not usually suitable for effluents containing large quantities of suspended matter, as the hoppers or valleys cannot be made steep enough to ensure evacuation of heavy sludge. Small cross-flow tanks (or other types) can, when concrete work is difficult or expensive, conveniently be designed and constructed in welded or pressed steel plates.

Another example of the cross-flow clarifier is the circular tank with central inlet and peripheral launder, equipped with a mechanically operated sludge scraper. These tanks are usually not more than 100 ft. in diameter, although some may have a diameter of up to 150 ft. The

TABLE

QUANTITIES IN PARTS PER MILLION

	pH Value	Suspended Solids	Suspended Solids Reduction %	Alkalinity as $CaCO_3$	Oxygen Absorbed 3 hrs. @ 37°C	B. O. D. 5 days	B. O. D. Reduction %	Chemical doses	
								Chlorine Activated Silica	Hydrated Lime
16.9.59									
Raw Effluent	7.6	628		190	11.6	180		8	50
Treated Effluent	8.4	2.5	99.5	158	4.0	13	92.8		
15.10.59									
Raw Effluent	6.5	483		74	14.0	78		6	70
Treated Effluent	7.5	3	99.4	128	5.5	7.0	91.0		
22.10.59									
Raw Effluent	7.4	344		162	6.6	88		8	75
Treated Effluent	8.4	3.2	99.0	138	5.0	9.0	90.0		
3.11.59									
Raw Effluent	6.2	496		54	15.6	94		5	60
Treated Effluent	7.3	1	99.8	138	6.7	9.5	90.0		
24.11.59									
Raw Effluent	7.0	352		130	8.3	132		5	45
Treated Effluent	7.8	6	98.5	148	4.9	3.0	97.5		
24.2.60									
Raw Effluent	6.9	128		120	9.0	175		4	60
Treated Effluent	7.7	8	94.0	134	5.2	18	89.5		

flocculation chamber is often built outside the settlement tanks and sometimes within the main tanks.

Vertical-flow clarifier

This clarifier is usually circular in shape and is so designed, with radial or circumferential troughs at the surface (and a central bottom inlet), to ensure as far as possible uniform vertical flow through the tank. The clarifier is provided with central or outside flocculation chambers (following a mechanized or hydraulic mixer) and is also equipped with mechanical sludge scrapers or extractors.

These are very good general-purpose tanks for effluents, as they are reliable and easy to operate. They normally work at a vertical-flow rate of 4 to 6 ft./hr. with a tank depth usually not less than 15 ft. The flocculation chamber is generally equivalent in size to 20 to 40 min. effluent throughout.

The clarifier in Fig. 1 is a typical example. The flocculators and the sludge scraper are operated electrically and sludging of the tank is carried out automatically at periodic intervals by means of an adjustable time controller.

Fig. 1 shows the Accelator clarifier fitted with a sludge scraper, this mechanism being used only when the effluent is known to contain a large quantity of suspended matter. The sludge accretion process clarifier has the unique property of being fitted with an impeller that pumps the mixture of effluent, sludge and coagulant in the manner shown on the diagram so that the whole is circulated 2½ to 3 times before the clarified effluent is abstracted from the slurry bed. The impeller mixer materially helps in the easy operation of the clarifier and permits higher flow rates compared with other forms of sludge accretion process tanks. The rate of circulation is adjustable by means of a cylindrical gate around the impeller. The light flocculant sludge is collected in concentrators and discharged automatically at predetermined intervals, while the heavy impurities are removed by the electrically driven scraper, again automatically at predetermined intervals. It is of interest to note that this clarifier tends to produce a thicker sludge than is obtained from other types.

In experimental work on a paper mill effluent to ascertain whether some improved method could be obtained, for purification, a pilot

Continued on page 29

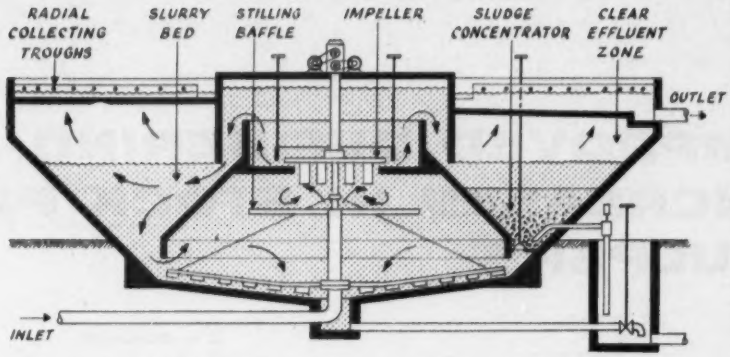


Fig. 1. View of a vertical-flow, accelator type clarifier.

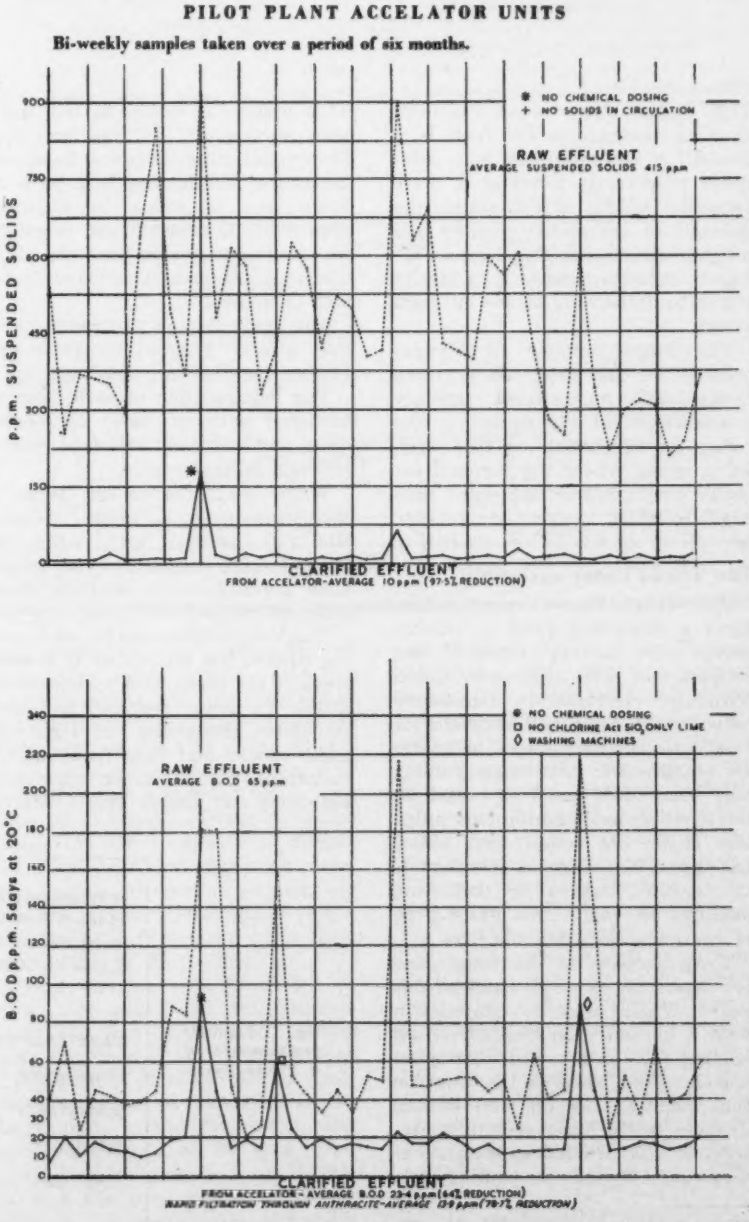

PILOT PLANT ACCELATOR UNITS
Bi-weekly samples taken over a period of six months.
p.p.m. SUSPENDED SOLIDS
* NO CHEMICAL DOSING
+ NO SOLIDS IN CIRCULATION
RAW EFFLUENT
AVERAGE SUSPENDED SOLIDS 415 p.p.m.
CLARIFIED EFFLUENT
FROM ACCELATOR-AVERAGE 10 p.p.m. (97.5% REDUCTION)
B.O.D p.p.m. 5days at 20°C
* NO CHEMICAL DOSING
□ NO CHLORINE Act SiO2 ONLY LIME
◊ WASHING MACHINES
RAW EFFLUENT
AVERAGE B.O.D 65 p.p.m.
CLARIFIED EFFLUENT
FROM ACCELATOR - AVERAGE B.O.D 23·4 p.p.m (64% REDUCTION)
SAND FILTRATION THROUGH ANTHRACITE-AVERAGE 13·9 p.p.m (79·7% REDUCTION)

Fig. 2 and 3 show experimental results with use of coagulants.

IMPROVED DEFIBERING AND CAPACITY INCREASES IN STOCK PREPARATION PULPERS*

C. H. KOHLHEPP
The Black-Clawson Company

THE Vokes Rotor is an improved working machanism for both bottom-drive Hydrapulpers and side-drive pulpers. It provides a more versatile pulping unit to satisfy the demand to completely defiber the tougher stocks and the demand for higher capacities today. It is ideally suited to despecking of wet strength stocks.

The large number of Hydrapulpers in the field today, more than 2,000, necessitated primary consideration in the design of the rotor. Its adaptation to these existing units, where the demand for better defibering or increased tonnage, or both, warrant conversion, as well as its use in new models.

The Vokes Rotor assembly

The Vokes Rotor assembly features a defibering rotor in combination with bar-type attrition ring bedplates or with perforated holes. Minimum clearance is maintained between the rotor and bedplate for most stocks. Perforated bedplates are employed in continuous pulping and extraction units or used in combination batch-continuous pulping. Defibering action with either bar-type or perforated bedplate is comparable. Degree or defibering obtained in continuous pulping is, of course, related to hole size.

Cross sections of the rotor vane are shown on the front cover of this issue. When used in conjunction with a bar attrition ring, the front leading edge of the rotor vane is flat and inverted towards the attrition ring slightly. The top and bottom surfaces of the vane present somewhat of a Hydro-foil appearance as they curve towards the trailing edge. This contour is similar to that used very successfully for the sweeping bars in Selectifier Screens. Its action keeps the attritioning ring bars or holes free of stock by creating alternately a positive and negative pressure as it sweeps over the bars. There is no contact between vane and bedplate.

The underside of the rotor vane may also be grooved for more effective breakup on some stocks.

The leading edge of each vane is provided with an insert of special wear and corrosion-resistant material and is replaceable.

Where corrosion is not present, the vane ring is made of cast BlaCaloy nodular iron, with the leading edge insert made of hardened stainless alloy of high wear resistant properties.

The Vokes Rotor and its attritioning surface has the ability to absorb tremendous shock and to efficiently utilize the power required for more complete defibering of unusual paper stocks and pulp furnishes. It maintains circulation at high consistencies and higher levels. Moreover, increased capacity ratings — as much as double on certain stocks — have been achieved with this versatile pulping unit.

Commercial installations

There are currently eighteen commercial installations including conversions now in the field of both bottom rotor types and Sydrapulper or side-drive types. They include sizes from 8 ft. to 18 ft. in diameter with up to 400 hp power requirements. Both batch and continuous pulping systems are in operation.

These pulpers are installed on the following types of stocks:

1. Bleached kraft
2. Unbleached kraft
3. Bleached sulfite
4. Waste news
5. Poly-coated separation
6. Waste corrugated
7. Dirty waste corrugated
8. Magazine broke
9. Wet strength broke and waste
10. Laminated-paper separation

An interesting comparison can be made on the capacity performance

PERFORMANCE COMPARISON
VOKES ROTOR vs CONVENTIONAL OPEN ROTOR
14' HYDRAPULPER
BLEACHED SULPHITE FURNISH

	VOKES ROTOR	CONVENTIONAL ROTOR
DIAMETER OF ROTOR	67"	72"
HORSEPOWER	350	200
CONSISTENCY	6%	6%
BATCH SIZE	4,500 LB.	3,000 LB.
TONS / DAY	300	100

Fig. 1. Capacity performance of a Vokes Rotor.

*Abridged from a paper presented at the 46th Annual TAPPI Meeting.

of a Vokes Rotor in a 14 ft. Hydrapulper versus conventional open rotor on bleached sulfite furnish, Fig. 1.

Note the relationships between horsepower and tons per day. Of course, to handle 300 tons per day in a 14-ft. Hydrapulper on a batch basis requires automatic loading equipment and fast dumping with little or no restrictions.

Reclamation of wet strength papers

Many wet strength papers such as melamine type, if chemically treated with alum or sulfuric acid to a pH in the range of 2.5 to 3.5 and pulped hot in the range of 160° to 180° F., will handle with the same ease as the basic non-wet-strength fiber. That is, a bleached kraft wet-strength-treated paper can be readily defibered to 100 Defibering Index in about the same time and with the same power requirements as basic untreated bleached kraft fiber, but only if heated and chemically treated to the proper degree.

In the case of under the machine broke pulpers where it is necessary to get the broker in and out of the pulper quickly, consideration is given to slushing, say, 10 to 20 Defibering Index, extracting from the pulper in this condition and further chemical treatment and fiber debonding being handled in other pieces of equipment such as mild re-cooking in a continuous digester and final despecking in the breaker trap or disc refiner.

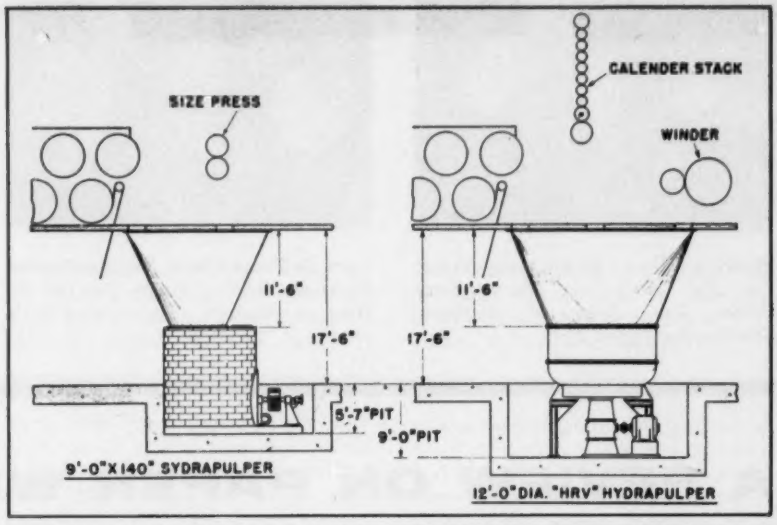


Fig. 2. Use of Vokes Rotor on a side drive or Sydrapulper reduces head room requirement.

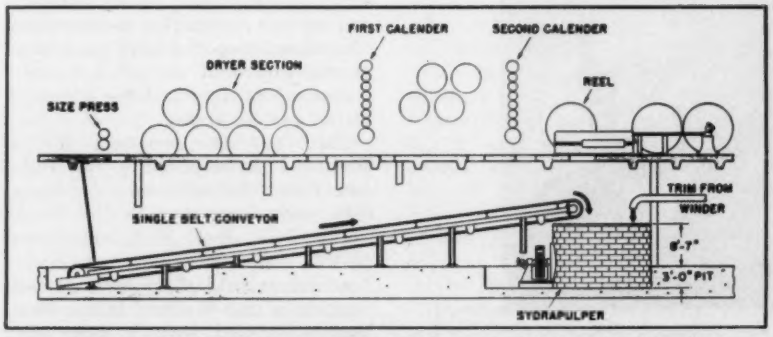


Fig. 3. Typical broke handling arrangement with conveyor belt and Sydrapulper.

CLARIFIERS

Continued from page 27

Accelator clarifier was installed, Figs. 2 and 3 showing in graphical form the results obtained. Coagulants were necessary with this effluent, the best results being obtained with about 40 ppm. of hydrated lime and 5 ppm. of chlorine activated silica. The results are quite remarkable and could not easily. be obtained by the use of a normal clarifier without some form of sludge accretion.

Notable example of clarifier use

A notable plant was designed and constructed by Paterson Engineering Co. Ltd., at the Glory Mill of Wiggins Teape in Buckinghamshire. The mill effluent here contained cellulose fibers, insoluble fillers such as clay and titanium dioxide, and soluble organic matter. It was decided to install a pilot plant before proceeding with the main effluent treatment plant. Careful records were kept of the cost of treatment, sludge volumes and the per cent reductions in suspended solids and Biological Oxygen Demand. After trying the effect of various chemical treatments and operating techniques, the information gained was used to modify the original design and the final tests were made from April 1956 to May 1957.

Some idea of the efficiency of this pilot plant can be obtained from the fact that when dealing with the normal mill effluent from April 1956 to October 1956 on only three occasions did the effluent fail to conform to the Royal Commission's standards of 30 ppm. suspended solids and 20 ppm. B.O.D., in fact the averages were of the order of 12 ppm. suspended solids and 15 ppm. B.O.D. From November 1956 to May 1957 the average results for suspended solid reduction was 97.5 per cent or from 415 ppm. to 10 ppm., while for B.O.D. reduction was 64 per cent from 65 ppm. without filtration and 78.7 per cent to 13.9 ppm. with filtration.

The final plant consists of a clarifier of Accelerator type, employing a forced circulation system and of somewhat modified design to meet the special conditions.

The raw effluent is pumped from the sump in the mill to the bottom of the Accelator clarifier where it flows upwards through a central diffuser below the rotor-impeller; the newly introduced effluent plus the circulation slurry is dosed with activated silica just below the impeller and is mixed by the rotor

Continued on page 33

Maurice Blew, Strathmore Paper Co.; Bob McCarron, Morningstar-Paisley Inc.; James C. Gallatin, Strathmore Paper Co.

Leon B. Timmerman, Buffalo Pumps Division, Buffalo Forge Co.; W. F. Hughes, Eastern Engineering Co.; Harry F. Schenk.

Roy Zellers, retired (formerly Mead Corp.); A. S. Erspamer, Scott Paper Co.; L. E. Simerl, Olin-Mathieson Chemical Corp.

A REVIEW ON PAPER WEEK

WARREN B. BULLOCK

H. M. WHITAKER
APPA president 1961-1962

H. M. ANNIS
TAPPI president 1961-1962

THROUGHOUT the week of February 19-23, leaders of the industry and outside authorities in the world of economics took a long hard look at the future in an effort to appraise the prospects of the industry in the year to come.

This year, the members of the Technical Association of the Pulp and Paper Industry met for their 46th annual meeting at the Hotel Commodore, New York. Members of the American Pulp and Paper Association held their 84th annual meeting at the Waldorf Hotel, New York—climaxed with a gala program celebrating the 100th anniversary of the founding of the Writing Paper Manufacturers Association, the oldest trade association in the United States.

General Lucius D. Clay, now chairman of the board of Continental Can Co. (which has the former Gair paperboard company as a subsidiary), reviewed the international situation, saying: "In spite of all our problems, I see nothing in the international picture which threatens our immediate future. With a sound economic basis at home, even in the troubled world of today in which we have learned to live, and in which we can continue to live, there would be no reason why we may not expect to be entering into a period of further economic growth at home".

Martin R. Gainsbrough, chief economist for the National Industrial Conference Board, gave his reasons for believing that the present business contraction may have reached its low point.

Morris C. Dobrow, executive secretary of the Writing Paper Manufacturers Association, in his annual review of industry conditions, said that despite the somewhat sour note of 1960 conditions, the decade is still young and there are no reasons for despair.

Unlimited opportunities for exports to the rest of the world were outlined at a meeting of the industry's Export Committee. Lawson Turcotte, president of Puget Sound Pulp & Timber Co., said that after a promising first quarter, the pulp industry tapered off in later months —but added that the manner in which the industry finished the year was evidence of economic stamine. The Export Committee meeting was told that in the five years ending 1959, world consumption of paper increased 40 per cent and the United States share in the markets outside this country has steadily increased.

Details of production conditions were presented at nearly every meeting of the divisional associations J. B. Cowie, its president, told the Kraft Association that, while tonnage was only slightly lower than in the record year of 1959, the year ended with price weakness. Peter W. Huguet, president of the Econometric Institute, however, gave the kraft manufacturers a touch of optimism in saying that gains in industrial production in 1961 would increase the demand for kraft paper and paperboard. Surveying the general picture, he estimated that over-all demand in 1961 would be 1.8 per cent above the total production in 1960.

G. C. Chase, Continental Can Co. Inc.; James H. Wing, Continental Can Co. Inc.; Colin R. Beeson, American Bitumuls & Asphalt Co.

Paul Trout, Waldorf Paper Products Co.; Wayne Draper, Hercules Powder Co.; Gervase C. Blick, American Bitumuls & Asphalt Co.

Robert W. Birch, West Virginia Pulp & Paper Co.; Stuart A. Dalheim, West Virginia Pulp & Paper Co.; Robert E. Lehman, Glidden Co.

P. H. Glatfelter III, chairman of the Printing Paper Manufacturers Association, was in an optimistic mood, saying that group produced an all-time high of 4,725,000 tons, an increase of 5 per cent over 1959, while the total paper and board industry output increased less than 1 per cent.

The most authoritative picture of the future of the industry was presented by Howard M. Whittaker, president of the American Paper and Pulp Association, in a press conference when he said that production in 1961 would probably duplicate that of 1960, a previous high record of output, but that the profit squeeze is going to get tougher. Stronger companies have been unable to raise prices to meet increased costs, and weaker companies have been forced to make price cuts. He said that production capacity would continue at about 10 per cent above normal demand, but that future efforts would be to cut costs rather than increase capacity.

A survey of the world situation in paper by the APPA was released during the convention. According to this report the Far East and Western Europe made the largest gains in consumption in 1960, with world usage increasing 4 per cent over 1959. Consumption total was listed as 83 million tons, but North America continues to account for more than half of the world consumption, the United States having 91 per cent of that figure. The Far East is demanding more and more paper, having more than doubled its use of paper and paperboard in the last six years.

Fears of restrictive action by the Government to prevent the use of various additives in packaging materials have not been borne out, according to a report to the Association's Materials Committee by R. C. Wilcox, vice-president of American Can Co.'s Marathon Division. Several hunderd additives have been approved as harmless, and few have been found deliterious.

An extension of the field of the National Council for Stream Improvement into the area of air pollution and the results of tests in the manufacture of kraft pulp was outlined at the meeting of that organization. The extension and successful efforts of the Council to eliminate pollution of the nation's streams was indicated by the statement that the current pollution of streams is less than 50 per cent of that in 1943 when the council was formed.

Forestry and the industry's work in the field of pulpwood production was the subject of a series of meetings by the American Pulpwood Association. Developments in forest management, safety, technical practices and pulpwood production statistics were reported by speakers from all of the country's timber areas. A research project on a three-year schedule will be conducted on a cooperative basis under which the parent association will coordinate studies on pulpwood reproduction already under way through the Southeastern Technical Committee of the Association, aiming at improved techniques of research and transportation. Speakers told of the developments and conditions in various sections of the United States, and several others told of developments in foreign lands. Progress in Canadian woodlands research, pulpwood harvesting methods in South America, and forestry and logging techniques in Russia, as well as the use of fibers other than wood in Asia were described by a long list of speakers.

The annual open meeting was featured by an address by R. M. Fowler, president of the Canadian Pulp & Paper Association, on the importance of preserving harmonious relations between the United

Jules J. Perot, National Gypsum Co.; W. H. McPherson, Minnesota & Ontario Paper Co. (MANDO); Walter Stauffenberg, American Cyanamid Co.

Fred H. Freuler, West Virginia Pulp & Paper; G. L. Galehuff, West Virginia Pulp & Paper; Charles E. Hill, West Virginia Pulp & Paper.

Joseph J. Aid, Continental Can Co. Inc.; A. T. Luey, Boxboard Research & Development Association; J. J. Harrison, New Haven Board & Carton Co.

R. J. Seidl (who presented the TAPPI medal); G. H. Chidester (winner of the TAPPI medal); J. R. Lientz (TAPPI president 1960-1961); H. M. Annis (TAPPI president 1961-1962).

Dr. R. A. Kavesh (speaker at open industry meeting) H. E. Whitaker (reelected president of APPA 1961-1962); R. M. Fowler (speaker at open industry meeting).

States and Canada. He urged Canadians to "Stop being overly sensitive in their attitude toward American investment" and urged American companies operating in Canada "To go to some lengths to discover what are the broad objectives of Canadian policies and what are the basic aspirations of the Canadian people". Referring to the Canadian paper industry, he said that 32 per cent is controlled by American parent companies, 11 per cent by British companies and the balance of 57 per cent is Canadian controlled.

The closing banquet of the Association saw all the past presidents of the Writing Paper Manufacturers Association on the dais, with the present members at choice seats in the front of the banquet hall. Norman W. Wilson, oldest living ex-president in point of service of both the American Paper and Pulp Association and the Writing association, gave "A Look Backward — and Forward". Arthur E. Crane, fifth generation representative of Crane Co. (which for over a century has made most of the paper for United States currency), reviewed the history of the Writing Paper Manufacturers Association. It was founded at Pittsfield, Mass., by 21 companies, four of which are still making paper. Morris C. Dobrow, long time executive secretary of the association said that the industry which made 76,950 lbs. of paper a day in 1860, last year produced 11,500,000 lbs.

Election of Officers for 1961

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY—*President*: H. M. Annis; *Vice President*: J. C. Wollwage; *Executive Secretary*: F. P. Doane Jr. and P. E. Nethercut; *Treasurer*: R. G. MacDonald; *Executive Committee*: J. H. Heuer; K. D. Running; W. Aiken; J. C. Kimble; Paul W. Bartholomew; W. P. Lawrence; H. O. Ware; Walter C. Bloomquist; H. A. Spencer; J. M. McEwen; A. H. Nadelman; F. S. Klein; J. J. Koenig; and P. S. Cade.

AMERICAN PAPER AND PULP ASSOCIATION—*President*: Howard M. Whittaker (Reelected); *First Vice President*: M. D. Bardeen; *Vice Presidents*: W. R. Adams; Alexander Calder Jr.; William H. Chisholm; R. C. Doane; R. F. Erickson; Robert Faegre; M. C. McDonald; J. L. Madden; Howard W. Morgan George E. O'Connor; R. J. Sund; Samuel R. Sutphin; Dwight J. Thomson; G. J. Ticoulat; and R. W. Wortham.

ASSOCIATION OF PULP CONSUMERS—*President*: Bartow Kelly; *Vice President*: E. R. Sutherland.

GLASSINE AND GREASEPROOF MANUFACTURERS ASSOCIATION—*President*: Guy E. McCorison; *Vice President*: T. Richard Probst.

KRAFT PAPER ASSOCIATION—*President*: R. A. Nash; *Vice President*: J. C. Hair.

NATIONAL COUNCIL FOR STREAM IMPROVEMENT—*Chairman*: George E. Dyke (Reelected); *Vice-Chairman*: Karl R. Bendetsen and Russell F. Erickson.

NEWSPRINT SERVICE BUREAU—*President*: Richard W. Wortham Jr.; *Vice President*: Curtis M. Hutchins.

PRINTING PAPER MANUFACTURERS ASSOCIATION—*Chairman*: P. H. Glatfelter III (Reelected); *Vice Chairman*: A. M. McBurney and F. H. Murtfeldt.

SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY—*President*: Jack K. Barry; First *Vice President*: James T. Kelly; *Vice Presidents*: Philip A. West: F. Ward Rosebush; Raymond G. Mather; John F. King; Charles Davis; and William H. Burk. In addition to the vice presidents, each representing a separate section of the country, an assistant vice president was named for each such division.

SPECIALTY PAPER AND BOARD AFFILIATES—*President*: Samuel R. Sutphin; *Vice President*: James P. Lewis; *Tag & File Folder Group Chairman*: Frank C. Cloyes; *Sanitary Food Board Chairman*: James S. Bentom; *Bogus Bristol Chairman*: James P. Lewis; *Coated Cardboard Chairman*: D. Kelly; *Mill Blank Chairman*: Samuel R. Sutphin.

SULPHITE PAPER MANUFACTURERS ASSOCIATION—*Chairman*: Aaron P. Mitchel (Reelected); *Vice Chairman*: Leslie W. Gould.

TISSUE ASSOCIATION—*President*: L. R. Watson; *Vice President*: R. A. Nash.

WRITING PAPER MANUFACTURERS ASSOCIATION—*President*: Donald S. Leslie; *Vice President* and *Chairman of Cotton Fibre Paper Group*: Walker J. Hosmer; *Vice President and Chairman Sulphite Bond Group*: G. E. Veneman; *Bristol Board Group Chairman*: L. E. Graham; *Cover & Text Paper Group Chairman*: William Beckett; *Thin Paper Group Chairman*: F. B. McFarland.

UNITED STATES PULP PRODUCERS ASSOCIATION—*Executive Board*: E. H. Clapp; R. S. Leslie; B. R. Cancell; Russell C. Flom; and G. J. Ticoulat, representing respectively the New England, Middle Atlantic, South, Lake and West regions. Fourteen other directors at large were elected with James L. Ritchie as Executive Directors.

CLARIFIERS

Continued from page 29

blades; it is then pumped up the inner draft tube, where lime is administered, flows down the outer draft tube and exits into the slurry pool below the clarified zone; effluent equal to the amount being pumped into the tank rises through the clarified zone and is decanted into the radial launders; the remaining circulation slurry is drawn back under the hood, to complete the circuit and again mix with the incoming effluent and chemical.

Slurry concentration is controlled by the amount of sludge discharged from the tank; heavier particles settle on the tank floor and are fed to the center by a slowly rotating scraper and discharged through an automatic valve, time switch controller; the lighter particles settle into two concentrators and are also discharged through automatic valves (See table).

Storage is provided on the ground floor for lime hydrate in bags, and sodium silicate in bulk. Chlorine in cylinders is housed in a separate room. Two horizontal tanks, each of approximately 24 hrs capacity are provided on the first floor for storage of the lime suspension. Lime hydrate is raised by electric hoist. Motor-driven paddles keep the lime in suspension. Rotating cups lift the lime and water mixture into a constant head tank and a calibrated orifice hand-set permits the required quantity to gravitate to the clarifier.

The activation and aging of the silica is a continuous proceess and the aging vessel and allied equipment are situated on the upper floor of the chemical building. A metering pump delivers a measured quantity of sodium silicate to mix with a metered quantity of water, and the resulting solution enters the bottom of the aging vessel through an injector; chlorine is measured in a Chloronome and also passed to the injector where it is entrained and rapidly absorbed into the solution; a water-operated ejector feeds the activated solution to the clarifier.

Acknowledgment is due to The Paterson Engineering Co. Ltd. and to the Wiggins Teape Group for data and illustrations.

REFERENCES

E. Field Reid and A. H. Waddington — The choice of a clarifier in the treatment of effluents. Paper prepared for the Paterson Co.

PAPER INDUSTRY IN THE FAR EAST

CONSUMPTION of paper and paperboard per person in the Far East averages out to 9 lbs. per year as against 405 lbs per person in the United States.

This is a dramatic indication of the status of the pulp and paper industry in the Far East, and its potential for growth, as reported by S. T. Han, faculty member of The Institute of Paper Chemistry at Appleton, Wis., who returned recently from the Far East where he attended the United Nations Conference on Pulp and Paper Development in Asia and the Far East, held in Tokyo, Japan, October 17 to 31, 1960.

While average consumption per person per year is only 2 lbs. in South Asia, Japan's 1959 average consumption was 88 lbs. which is well above the world's average of 54 lbs.

This uneven production and consumption of paper within the Far East is further apparent by the fact that if Japan's and China's output were pulled out, almost 90 per cent of the entire Far East's paper production would disappear.

If nothing were done about it, this difference in the use of paper could get worse. This is borne out by the fact that while South Asia increased its use of paper by only 15 per cent in the last ten years, East Asia, which includes Japan, increased its consumption by 650 per cent.

Listed as specific problems in the far East were capital and raw materials.

Capital

Long-term capital is in short supply. Consequently interest costs are very high. On Formosa, for example, the interest rate is in the range of 15 to 20 per cent for short-term loans. In some economically more retarded countries, the charge of 50 per cent interest on a one-year loan is not uncommon. (Japan is an exception to these conditions of capital).

Coupled with this is the fact that new paper plants must be small, in the range of 20 to 50 tons per day, which raises the amount of capital neccessary to be invested per unit produced.

The estimated Far East investment per daily ton is from $200,000 to $400,000 for an integrated mill as compared with $80,000 to $120,000 in the United States.

The size of the investment must be large because most mills need to be highly integrated from forestry through warehousing facilities.

Raw materials

The wood supply presents problems because forests are located some distance away from population centers and substantial forest-areas are inacessible. In most regions, broad-leaved farests predominate.

Bamboo is an excellent source for production of chemical pulp, and in certain regions will probably be the principal source of fibrous raw material in the future. At present, however, two factors limit its supply for paper-making purposes:

(1) it is used extensively for construction and other purposes;

(2) after an interval of years, the bamboo flowers and the whole plant dies.

While bamboo re-seeds itself subsequent to flowering, a number of years is required for re-growth. It has been noted that all plants of a single species flower in the same year. This means that a 20,000-acre plantation of bamboo could be producing one year, and be completely unproductive the next year.

Bangasse is being used satisfactorily at present and has the advantage of a centralized supply from sugar mills. However, but without solving the problem of depithing and producing a better pulp by developing a new, or modifying an established, pulping process, bagasse pulp will remain extremely slow in drainage and rather deficient in strength.

Straw, especially rice straw, gets costly after collection, transportation, and storage. It also has a high silica content and very short fibers.

Solutions

Solutions offered for these problems at the U. N. Conference were a properly programmed reforestation project for wood supply.

For bamboo, a plantation program was recommended based on sound genetics.

Bagasse might require the development of a new pulping process, or a modification of present processes.

For the manufacture of fine paper from straw, the Pomilio chlorine process seems to be a feasible one, but suffers from the lack of a suitable chemical recovery, process.

For all raw materials in the grass family, one possible technological advance would be the development of a two-stage cook. In the first stage, the pith and parenchyma materials would be chemically removed, followed by mechanical separation. The second stage would remove more lignin to further free the fibers.

Status of far east pulp and paper industry generally

Japan's industry is highly developed, but the ancient art of hand-made paper exists side by side with very modern mills. Japanese technicians appear to know their jobs very well and are inquisitive about United States technical development.

At a somewhat lower level is the paper industry on Formosa and in India.

Formosa has about 50 pulp and paper mills, most having a daily capacity of several tons. The largest produces about a hundred tons daily.

But Formosa also presents an oddity. Larger mills are losing money, while the small ones operate profitably.

This paradox is due to the local situation which makes it possible for the small mill to have less capital invested per unit of production than the large mills do.

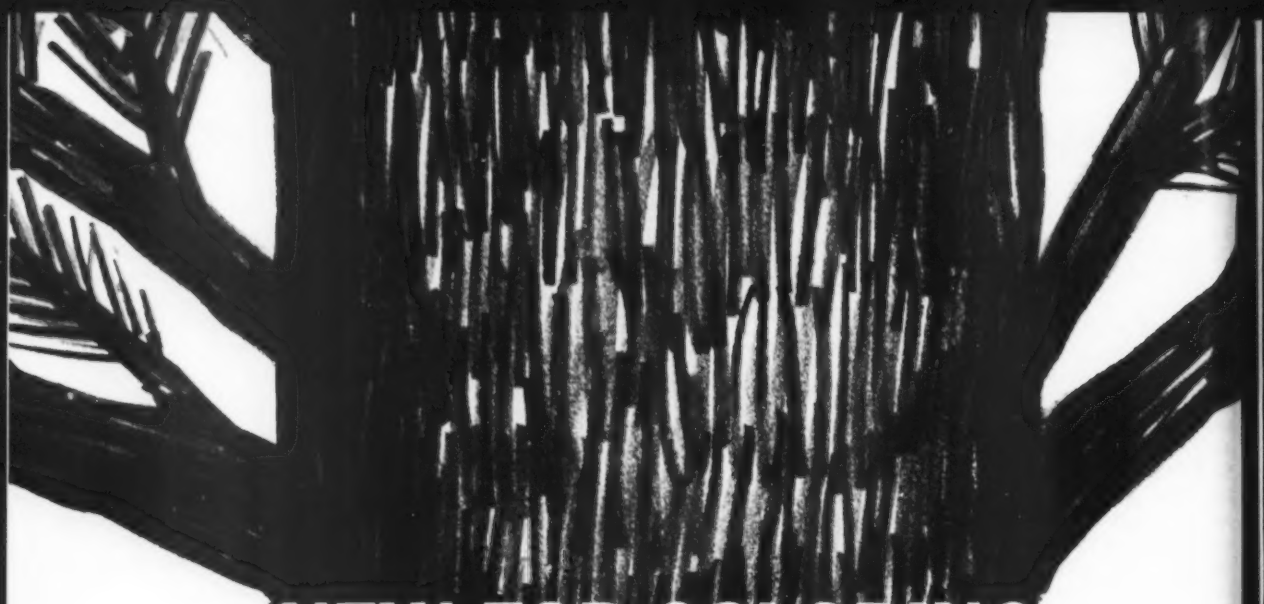
This smaller investment is due to the following factors:

(1) With limited production, all raw materials can be procured locally, and all production can be sold locally. This eliminates much "distance" cost of transportation, communication, etc.

(2) The cheapest equipment can be used, supplemented by much low-cost labor. This further reduces capital investment.

(3) Many of the small mills are a family business, further reducing the overhead.

Under these peculiar conditions small plants can make money, while the large Formosa mills survive only by export and government subsidy.



NEW-FOR COLORING PAPER IN THE PULP

STILBENE YELLOW 10 GP

Sized papers gain a premium look at budget prices

Dye lively canary and green shades with economy and satisfaction.

Reduce costs to new lows for bright yellows on commercial grades of bond, register, tissues, and wrapping papers. See the excellent color value and dyeing properties—light fastness comparable to other Stilbene Yellow types—nondusting.

Inquire how you can profit with this new direct dye and other GDC Stilbene Yellows in meeting your color requirements on sized papers.

Ask about—

STILBENE YELLOW TP CONC	economical reddish yellow
STILBENE YELLOW 3 GA CONC CF	slightly greener than Yellow TP Conc
STILBENE YELLOW 5 GXA	greener, brighter than Yellow 3 GA Conc CF
STILBENE YELLOW 6 GP	greener, brighter than Yellow 5 GXA
STILBENE YELLOW 8 GP	greener, brighter than Yellow 6 GP
DIRECT YELLOW CPA CONC	alkali-fast Stilbene types:
DIRECT YELLOW OPN	balancing colors for Paper Yellow 3 GXA

Call your GDC Technical Service Representative for complete information and samples or write us direct.

FROM RESEARCH TO REALITY

GENERAL DYESTUFF COMPANY

A DIVISION OF GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

CHARLOTTE • CHATTANOOGA • CHICAGO • LOS ANGELES • NEW YORK • PHILADELPHIA • PORTLAND, ORE. PROVIDENCE • SAN FRANCISCO • IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA, LTD., MONTREAL

STILBENE YELLOW 10 GP MANUFACTURED BY GENERAL ANILINE & FILM CORPORATION, TO BE SOLD OUTSIDE THE UNITED STATES AND CANADA UNDER THE TRADE NAME "FENAMIN YELLOW 10 G" BY DISTRIBUTORS ALL OVER THE WORLD

SUPER 6
NAPKIN FOLDER

2100 NAPKINS PER MINUTE!!

• Emboss, Cut, Fold, Count and Deliver 2100 Quarterfold or Dispenserfold Napkins per minute • Accurate rotary shear cut-off -- Up to three years between blade changes • Convenient discharge level for operator efficiency and fast packaging • Three double width parent rolls increase production flow with minimum handling, waste and downtime.

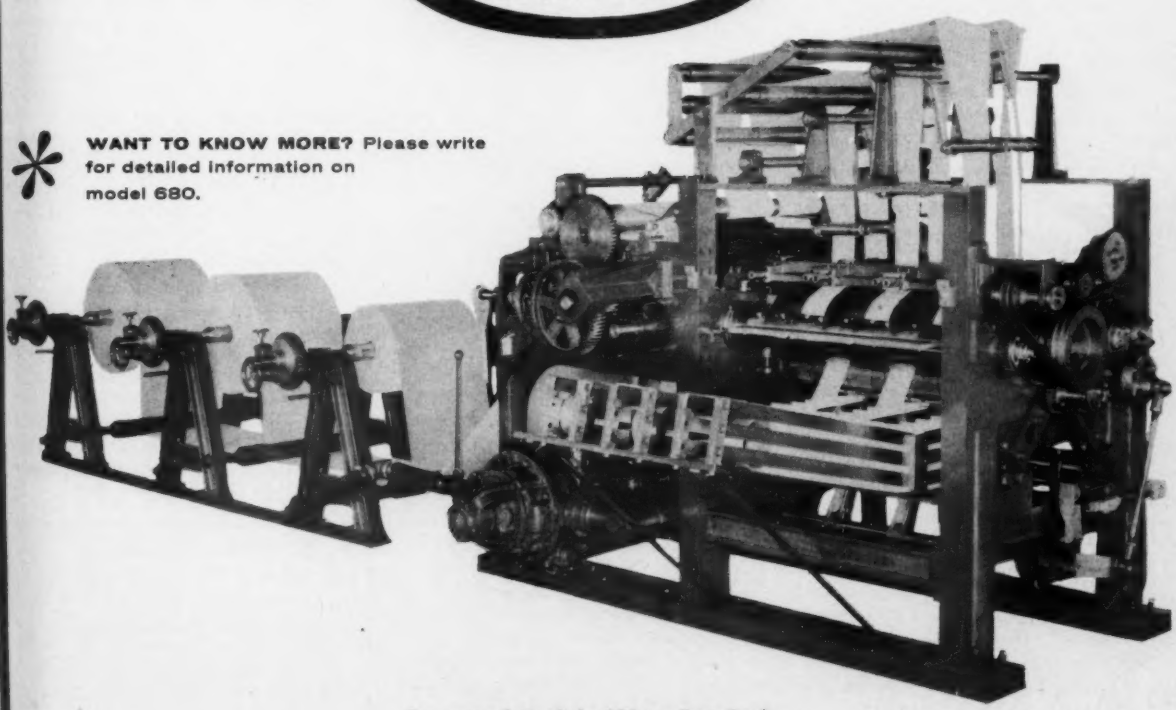
SUPER 8 NAPKIN FOLDER - All the major advantages of Super 6 plus production capacities up to 2400 napkins per minute from 4 parent rolls.

creative engineering and development

Paper Converting MACHINE COMPANY
GREEN BAY, WISCONSIN

of converting machines since 1919.

WANT TO KNOW MORE? Please write for detailed information on model 680.



For more data circle 120 on Post Card

DICALITE® TECHNICAL REPORT

DICALITE DEPARTMENT • GREAT LAKES CARBON CORPORATION • 612 SO. FLOWER ST., LOS ANGELES 17, CALIFORNIA

New Dicalite BULK-AID® for Paper Products

Dicalite BULK-AID is a new development in inorganic fillers, with particle size range and distribution carefully controlled to give maximum bulking characteristics in paperboard and paper products. BULK-AID has the lowest apparent or bulk density of any known mineral filler for papermaking use, thus providing required caliper at lower weights. One example is that of a 40-point groundwood sheet whose weight was reduced from 29.2 lbs/ft³ to 27.3 lbs/ft³ by the addition of 10% BULK-AID.

The light weight and bulking characteristics of BULK-AID make it especially suitable for use in paperboard; its high brightness and excellent retention are also of considerable value. BULK-AID lowers the furnish cost and increases pulp mileage in top liners for patent white paperboards. Its brightness and opacity raise the quality of underliners at the same time it extends the furnish.

Dicalite BULK-AID is an amorphous mineral, technically an aluminum silicate, produced from a volcanic mineral known as perlite by a special process developed by Great Lakes Carbon Corporation. BULK-AID is inert, insoluble in water, acid or mild alkalies. It is grit-free, and exhibits no reaction with alum in sizing or with other papermaking chemicals. It is readily dispersed in any furnish, does not cause foam, and will not fill felts.

Among BULK-AID's physical characteristics are these:

Color: White

Average G.E. Brightness: 83

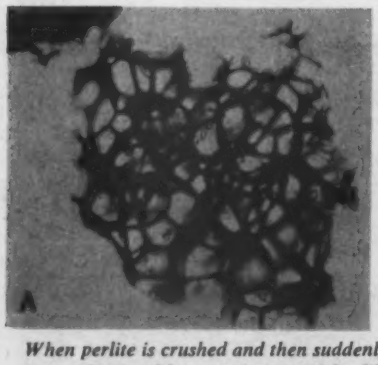
Loose weight: 4½ lbs/ft³ average

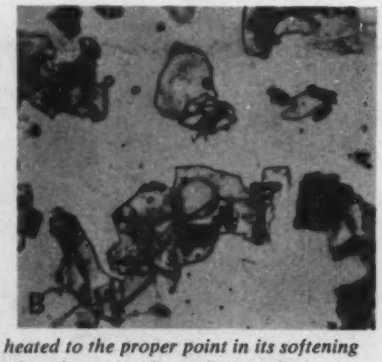
Bulk densities in paperboard: 15 lbs/ft³ average.

Particle size: 80% less than 10 microns

Extensive testing has shown BULK-AID to be successful in actual paper mill production. Most of these tests were on cylinder machines for paperboard production, but limited tests indicate its value in many slow speed fourdrinier applications.

Your Dicalite engineer will be glad to discuss BULK-AID with you and to advise on possible product applications in your own plant.





When perlite is crushed and then suddenly heated to the proper point in its softening range, it pops like corn into particles like that shown in photomicrograph A, containing a myriad of microscopic sealed cells. The size of the original particle and the application of heat are both important, and are critically controlled. This is the expanded material from which BULK-AID is produced. Controlled milling and air classification by an exclusive Great Lakes Carbon Process are the major steps in making BULK-AID, typical particles of which are shown in photomicrograph B.

© 1961 GREAT LAKES CARBON CORPORATION • LOS ANGELES, CALIF.

For more data circle 121 on Post Card

Gordon G. Halvorsen

DICALITE'S "MAN ON THE SPOT"

The development of Bulk-Aid, to meet the industry's need for an extremely low density bulking agent, was initiated by Gordon Halvorsen, Product Sales Manager for Dicalite, and he has been closely identified with its tests and product application work from the beginning.

Halvorsen has an extensive background in research and development work, beginning with his graduation from the University of Minnesota with a degree in Chemical Engineering. Prior to joining Great Lakes Carbon in 1940, Gordon had been engaged in technical and laboratory work in the pharmaceutical, corn processing and water treatment fields, and continued his research work in the Dicalite product laboratories for the first 5 years of his association.

Halvorsen is the author of several technical papers, and has contributed to both paper industry and brewing publications. Among his technical society memberships he lists TAPPI, American Society of Sugar Beet Technologists, Master Brewers Association of America, and others in the brewing and drycleaning fields.

NEW DATA SHEET

on Dicalite *BULK-AID* gives more complete information on physical and chemical properties, and on its advantages in papermaking. Write for your copy to Dicalite Dept., 612 So. Flower St., Los Angeles 17, Calif.

celgar bleached kraft paper pulp is now available

five pound test sample on request

COLUMBIA PULP SALES LIMITED

Distributor for Celgar Kraft and Columbia Cellulose Sulphite Pulps

1030 WEST GEORGIA STREET, VANCOUVER 5, B.C. • 1600 DORCHESTER STREET WEST, MONTREAL, P.Q.

Warren B. Bullock

Interest in the merchandising field brings on more expansion

To the ultimate consumer

A second of the nation's largest paper manufacturing companies has expanded into the distributing field by the acquisition of an important merchandising company, thereby integrating its operations from the forest to the ultimate consumer.

Mead Corporation has purchased, for cash, a controlling interst in Chatfield & Woods Co. of Pittsburgh. This action by Mead follows closely the Champion Paper & Fibre Co.'s entry into the merchandising field by its merger with an important midwestern merchandising corporation. In securing control of Chatfield & Woods, Mead Corp. acquires a group of subsidiaries in Cincinnati, Hartford City, Cleveland, Buffalo, Detroit, Grand Rapids, Nashville and Columbus. The dollar value of the Chatfield & Woods business is in excess of $10,000,000 a year, and it has long been a distributor of Mead papers and paperboards.

Stock market activities involving three paper companies have been attracting the attention of Wall Street specialists. Certain-Teed Products Corp. has arranged a $100,000,000 credit from the Universal CIT Credit Corp. to facilitate the retail sales of low-cost houses built from Certain-Teed products. Certain-Teed organized the Institute of Essential Housing Inc., to merchandise a complete line of houses on a national basis, utilizing Certain-Teed's development of the so-called, shell-type of building construction from a new type of paperboard fabrication. The deal with the Credit Corp. will permit the merchandising of low-cost houses in various stages from the mere shell to a completed building. The popularity of the new project gave Certain-Teed securities a boost in the stock market. In the first two months of the year, one economist computed that Certain-Teed was the biggest gainer of nearly 250 securities studied, its gain being 81 per cent.

Foreign operations

International Paper Co., with its expansion into world-wide production, has set up a new division to direct and coordinate the company's rapidly growing overseas production operations and its export activities, as well. John F. Howden, an International vice president, is president of the new division. William D. Hurlbut, Gunnar M. Oleson, Wentworth Brown and Ernest de la Ossa are vice-presidents. Previous to recent announcement of purchase of various Latin-American pulp and paper mills from the W. R. Grace interests, the International Paper Co. had already, among its other foreign operations, established cooperative companies with German and Italian manufacturers and also has a half-interest in a shipping container plant in Israel. International also has a paperboard milk bottle subsidiary in Venezuela.

Parsons & Whittemore organization, which has long studied potential paper manufacturing possibilities in Latin-America has signed a contract wth Ledesma S. A. Agricola Industrial of Argentina for the design and construction of a mill to utilize the bagasse waste from the Ledesma company's large sugar mills. The Export-Import Bank has authorized a credit of $9,100,000 for the purchase of United States equipment and construction services.

Scott and the FTC

Scott Paper Co. has begun its active battle against the Federal Trade Commission's order to divest itself of various companies which had been merged into the Scott organization. The Scott company has formally asked the Federal Court of Appeals at Philadelphia to set aside the Commission's order. The whole record, according to Scott, shows that none of the acquired companies was a competitor in Scott's field, and that therefore there was no limiting of competition by their acquisition.

Meanwhile, the company has announced that it will take over the assets and business of two wholly owned subsidiaries — the Coos Bay Pulp Corp. of Anacortes, Wash., and Empire, Ore.; and the Marinette Paper Co. which operates a pulp and paper mill at Marinette, Wis., and paper mill and converting facilities at Fort Edwards, N.Y.

Developments in Asia

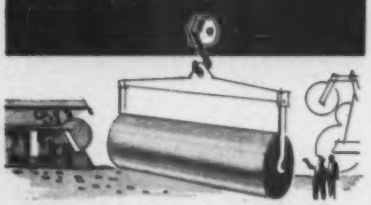
A problem of the paper industry in the Far East is the fact that raw material sources are usually remote from population centers, according to a report made at a Seminar of the Institute of Paper Chemistry by S. T. Han, a faculty member who attended the recent United Nations pulp and paper conference on developments in Asia. The cost of paper mill installation in Asia is complicated by the fact that new plants must be small, in the range of from 20 to 50 tons per day, raising the initial cost of investment to from $200,000 to $400,000 per ton of daily capacity, as compared with the normal cost of the larger integrated plants in the United States of $90,000 to $120,000 per daily ton. Bamboo is an excellent raw material source in Asia. In the timber regions broadleaf species predominate.

Corporation Changes

A merger of the *Midland-Ross Corp.* and *Industrial Rayon Corp.* has been approved. Under the terms of the proposed merger, each of the 1,851,255 shares of Industrial Rayon will be converted into two-fifths of a share of Midland-Ross common stock. Industrial Rayon has no other securities outstanding. Industrial Rayon will operate as a division of Midland-Ross. Both companies are based in Cleveland, O.

Nashua Corp. of Nashua, N. H. has announced that it is purchasing the assets and business of *Gubelman Charts Inc.* of Newark, N. J. Gubelman, a well known printer and dis-

TRANSALL Pre-Lubricated Idlers . . .



Savings for the Pulp and Paper Industry

Transall pre-lubricated idlers are the product of years of experience in manufacturing belt conveyors for the pulp and paper industry. Bearings of Transall Pre-Lubricated Conveyor Idlers are factory sealed—never require re-lubrication. More important, perhaps, there is no leaking grease to deteriorate your conveyor belt. Entry of abrasive dust, foreign matter, etc., is kept to a minimum to prevent destruction of bearings, the heart of an idler. **Result:** No lubricating costs, longer belt life, idlers last longer, maintenance costs less.

Idlers are available in 20°, 35° and 45° equal and unequal length rolls with various roll diameters and thickness of tubing wall.

We also manufacture complete pre-engineered sectional belt conveyor systems. Write or wire Transall Inc., 109 No. 11th, Birmingham, Alabama, for complete details.

Perfectors of the Pre-Lubricated Idler

TRANSALL, INC.
109 North 11th St. • P. O. Box 1588
BIRMINGHAM ALABAMA

For more data circle 123 on Post Card

CURRENT COMMENTS

Continued from page 39

tributor of recording instrument charts, will continue to be operated in its plant in Newark as a division of Nashua.

Bowater Paper Corp. Ltd. has offered to acquire all of the outstanding shares of *Paper Industries Ltd.*, St. Moritz, Switzerland. Bowater acquired control of Paper Industries in June 1960 and is offering to buy the remainder of the outstanding shares.

The *Baltimore Paper Box Co.* and *Chesapeake Corp. of Virginia*, West Point, Va., have reached an agreement making it possible for Chesapeake to acquire the assets of the Baltimore firm for an undisclosed amount of cash.

Hammermill Paper Co., Erie, Pa. has offered to exchange up to 24,000 common shares of its common stock for all the outstanding common stock of *Burgess Envelope Co. Inc.* of Chicago, Ill.

American Paper Specialty Co., New York, N.Y., has been purchased from *Rapid-American Corp.* for $11,750,000 in cash and notes by an independent group.

Dominion Tar and Chemical Co. Ltd. has offered to acquire all of the outstanding common shares of the *St. Lawrence Corp. Ltd.*, a Canadian paper manufacturer. Dominion Tar, a producer of building materials and chemicals, said that it would exchange eleven shares of its common stock for eight shares of St. Lawrence common outstanding.

Kennebec River Pulp & Paper Co. has taken an option to buy *Scott Paper Co.'s* groundwood pulp mill in Madison, Me. The Kennebec-Scott agreement deals exculsively with Scott's Madison mill and the water rights connected with it.

Atlas Powder Co. of Wilmington, Del. and *Stuart Co.* of Pasadena, Calif., are intending to merge. This involves a four-for-one split of the Atlas common stock. If approved, Stuart will be operated as the Stuart Division of Atlas Powder Co.

Three companies in the packaging industry have merged to form *Howell Litho & Cartons Ltd.*, a wholly-owned subsidiary of *Dover Industries Ltd.* The new company results from merging *Howell Lithographic Co.* with the carton division of *Robinson Industries Ltd.* and the *Filey-Hall Paper Box Co.*

International Paper Co. and *W. R. Grace & Co.* have announced the signing of an agreement under which International has acquired the Grace enterprises in Puerto Rico and Mexico and will participate with Grace in an operation in Columbia. The Grace paper manufacturing and converting operations in Peru are not involved in the transaction.

Reyburn Mfg. Co. of Philadelphia has discontinued operation of its *Tag Mfg. Division* and will now be known as *Reytrim Mfg. Co.* All equipment, inventory and facilities for tags, labels, seals, etc. have been sold to the *Denney Tag Co.* of West Chester, Pa. The sales did not involve the Reyburn Display Division in Royersford, Pa. The Denney Tag Co. has received stock holder approval to change its name to *Denney-Reyburn Co.*

Strong, division of *White Sewing Machine Co.*, Conneaut, O., has announced the recent purchase of the manufacturing and sales rights for certain products from *Crane Co.*, Chicago, Ill.

General American Transportation Corp. of Chicago has acquired the outstanding stock of *INFILCO Inc.* of Tucson. Present plans are that the Tucson firm will continue under its present management as part of the Fuller group of General American Transportation Corp.

Pall Corp. of Glen Cove, N.Y., has announced the recent acquisition of the outstanding capital stock of three Canadian corporations engaged, under common ownership, in the manufacture and sale of water treating equipment for industry, farm, institutional and home purposes. The Canadian corporations acquired are *Hollinger Machine Co. Ltd.*, *Beaumont Pumps Ltd.*, and *Sani-Hydro Co. Ltd.* of Montreal, Que.

Hamilton Paper Co., Miquon, Pa., has reached an agreement with *Weyerhaeuser Co.*, Tacoma, Wash., to merge through an exchange of stock. Stockholders would get 0.9 shares of Weyerhaeuser for each Hamilton share held. There are about 380,000 Hamilton shares outstanding.

Ellington & Co. has acquired the accounts and personnel of *John Mather Lupton Co.* Both are advertising agencies.

Continued on page 49

Training for Profit

In conjunction with the 17th Annual Conference of the American Society of Training Directors, a one-day meeting will be held to discuss training methods and specific training problems encountered in the pulp and paper industry.

Training for Profit is the theme of this year's conference. Anyone employed in the pulp and paper industry who has responsibility for the training and development of people will be interested in this meeting which is scheduled for May 1 at the Bellevue-Stratford Hotel in Philadelphia, Pa.

Another "extra" in the three-day conference will be a series of "trading post" meetings on the afternoon of May 3. These meetings will schedule 30 training subjects such as: training needs and how to find them; tools and techniques for training; employee performance and appraisal; supervisory development; executive skills; communication; cost reduction; sales; and computer programming.

Information about the pulp and paper meeting may be obtained by writing to Mr. Lenzi, Director of Training, at Mead Corp., Chillicothe, Ohio. Inquiries about the full conference may be directed to: 17th Annual A.S.T.D. Conference, Box 8109, Philadelphia 1, Pa.

W. S. Tyler Introduces Fourdrinier Wire of Stainless Steel

W. S. Tyler Co. of Cleveland, O., has announced a new type of paper machine wire called Ty-Flex. It is made of stainless steel — the first successful use of this material for fourdrinier machine application.

The company states that the product development was started in response to a need by the paper industry for a more durable material that would resist both excessive corrosion and abrasion better than either the plain or plated phosphor bronze wires normally used. In semi-chemical mills particularly, the problems of corrosion and abrasion result in a relatively short life for the wires.

The wire displays the flexibility of the stainless steel cloth, which can be woven in plain, semi-twill, or full-twill weave, and is comparable to cloth made of bronze alloys. The wire maintains its drainage rate better than bronze, and has less tendency to dimple or dent. Another advantage is the longer life: the wires have obtained as much as 50 days service.

Tappi's Eastern District To Hold Symposium

Printing and Paper is the subject of the Sixth Annual Symposium which will be held by the Eastern District of the Empire State Section of Tappi.

This symposium will be held in the Grand Ballroom of the Queensbury Hotel, Glens Falls, N.Y., on Thursday afternoon, April 20. Registration period is from 12:00 noon to 2:00 pm, and the technical session will begin at 2:00 pm.

The subject of Printing and Paper will be covered by each speaker and will include a description of particular printing process with which he is concerned; the paper characteristics required for good performance on the presses; and general aspects of press room operation.

Speakers and their topics are: "Gravure Printing" by F. W. Goetz (Publication Corp., New York, N.Y.); "Letterpress Printing" by Earl Brown (McCall Corp., Dayton, Ohio); "Offset Printing" by William Palinski (Western Printing & Lithographing Co., Poughkeepsie, N.Y.).

New Corporation

The formation of a new company, COMCO Corp., was recently announced. COMCO manufactures and markets equipment that incorporates unique and revolutionary design principles for the classification and conveying of materials. The equipment includes a system of vibratory screens and conveyors, hydraulic classifiers and dewatering equipment.

Marathon Converts Spent Liquor to Marketable By-Product

The Marathon Division of American Can Co., is showing the way to effective stream pollution control by turning its concentrated spent sulfite liquor into a dry product for industrial uses.

Marathon has installed a Nerco-Niro spray dryer at its Green Bay pulp and paper mill. This dryer provides for 50 tons of finely powdered chemicals now being produced each day and sold under the trade name of "Norlig".

The spray drying process produces a free flowing granule of exceptionally high bulk density through use of a special atomizer wheel which was developed to cope with the liquor concentrate. Working as a team, Marathon technicians and technicians from Nichols Engineering & Research Corp. (80 Pine St., New York 5, N.Y.) conducted extensive trial runs at the Nerco-Niro laboratories. Based on the successful results, the Nerco-Niro organization was chosen to proceed with the design and construction of the spray dryer shown.

recent expansions

Field Will Move Into Custom-Designed Plant

Field Paper Box Co., an independent producer of folding and set-up boxes in the Chicago area, will be moving into a new custom-designed manufacturing plant and office early this summer. The new plant will be located in the Centex Industrial Park of Elk Grove Village — a northwest suburb of Chicago. It will be built on a 300,000-sq.-ft. site and will contain 70,000 sq. ft. on one level, with curtain-wall construction, permitting easy expansion.

When the building is completed, the firm will have added 22,000 sq. ft. to its production facilities. "This move", stated Eli Field, president of the company, "will increase production capacity and enable us to achieve maximum production efficiency". Field also anticipates providing new and an even more varied product by virtue of this move.

The company produces all types of folding and set-up boxes to fit specific requirements for such industries as: toy; candy and confectionery; dairy; electrical; hardware; sports equipment; automotive; and plastics. Highly specialized machinery are utilized for unique processes such as latex pressurized sensitive box ends for folding boxes; latex cards; and heat seal, bubble and blister pack; and heat seal for frozen food packaging. Production area in the new plant will be allocated for additional specialized machinery.

Field Paper Box Co. was founded by Eli Field in 1942 under the name of Central Paper Box Co. At that time it consisted of four employees and a 5,000-sq.-ft. plant. Four years later the current name was adopted, the firm was then incorporated, and another move was made to a larger plant employing 40 employees. In 1955 the firm bought out the Terre Paper Box Co. of Chicago, where it now has 160 employees and covers 48,000 sq. ft., exclusive of warehousing.

The first spadefuls of earth are being turned by Eli Field (right), president of Field Paper Box Co.; an animated paper box — "Miss Paper Box"; and Charles Hodlmair, Elk Grove Village president.

H. P. Smith Installs Coater

With the addition of a new 76-in. polyethylene extrusion coater made by Egan, the H. P. Smith Paper Co. has increased coating facilities to six production machines in addition to its laboratory coating equipment. This increase in facilities enables the company to expand scheduling and production of polycoated papers, films and boards.

All six coaters are currently operating on a round-the-clock basis, and peak production can be maintained coordinated with six 85,000-lb. storage silos mounted on the plant's roof. This airveying system moves polyethylene from dry-flo rail cars to the silos, thence to the coaters and handling time is eliminated.

Huyck Felt Announces Improvement Program

Huyck Felt Co. has announced the company's plans for a $2-million plant improvement program. The program was half completed during 1960 when the company spent $1,100,000 for new equipment and plant modernization.

In 1961 the company plans to spend an additional $1,100,600 for equipment and plant renewal. Included in the program is the expenditure of $642,300 for the purchase of new weaving equipment. Other purchases to be made are equipment for the Huyck Science Center, yarn and finishing machines and several items of manufacturing equipment.

St. Regis Builds Technical Center

A $3-million technical center for the development of new uses and new markets for paper has been started for the St. Regis Paper Co. in Clarkstown, N.Y., by the Wigton-Abbott Corp. of Plainfield, N.J.

The 60,000-sq.-ft., two-story research facilitiy is scheduled for completion in October of 1961. It is being built on a 60-acre site.

In addition to the technical departments, the center will also include a reference library, conference rooms and administrative offices.

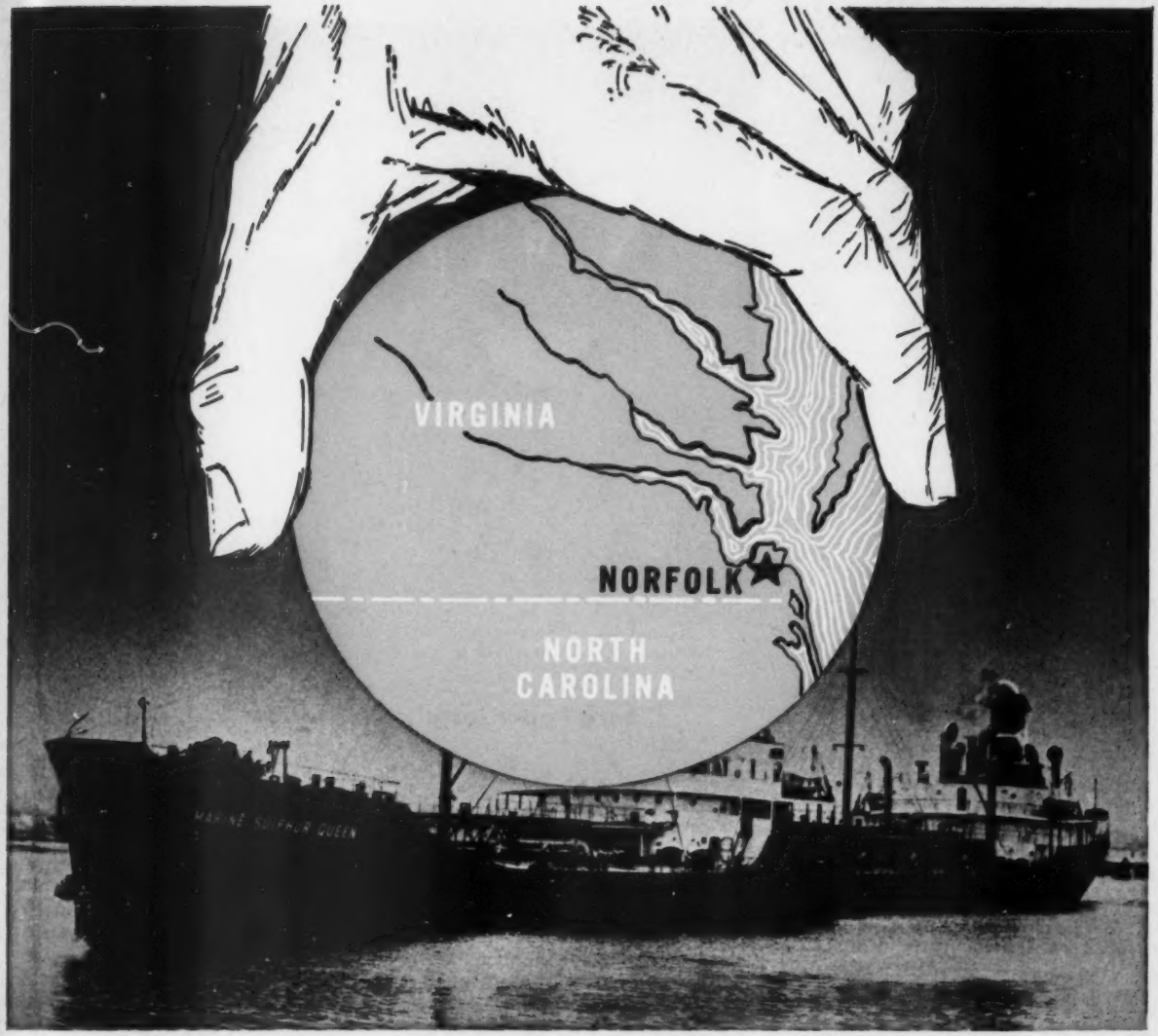
A. E. Staley Expands Relations With Two European Corn Refiners

A. E. Staley Mfg. Co. of Decatur, Ill., has announced an expanded working relationship with two European corn refiners through its wholly owned Swiss subsidiary, Staley A.G.

The new relationship will increase the exchange of technical information between Staley Co., Glucoseries Reunies, S.A. of Alost, Belgium, and Tunnel Glucose Refineries Ltd. of London, England.

As part of the new arrangement,

Continued on page 44



add NORFOLK, VIRGINIA... to the growing list of TGS local distribution terminals for MOLTEN SULPHUR.

And how does Norfolk keep its 20,000 gross ton storage capacity stocked well ahead of demand?

By our new 15,000 ton tanker, the Marine Sulphur Queen, which on a 10 to 12 hour turn around schedule takes on cargo at our new large main supply terminal at Beaumont, Texas. From Norfolk we are supplying Mid-Atlantic plants by tank car and tank trucks.

As part of a broadening program of molten sulphur deliveries, TGS is now operating several large distribution terminals located in major sulphur consuming areas.

Carteret—molten • Cincinnati—molten
Norfolk—molten, solid • Tampa—molten, solid
Other terminals are in the planning stage.

(PHOTO): The MARINE SULPHUR QUEEN heading into Norfolk.

TEXAS GULF SULPHUR COMPANY
75 East 45th Street, New York 17, N. Y.
811 Rusk Avenue, Houston 2, Texas
Sulphur Producing Units:
NEWGULF, TEXAS • MOSS BLUFF, TEXAS • FANNETT, TEXAS
SPINDLETOP, TEXAS • WORLAND, WYO. • OKOTOKS, ALBERTA, CANADA

For more data circle 124 on Post Card

Continued from page 42

the Staley Swiss subsidiary has recently purchased a financial interest in Glucoseries Reunies, S.A., and also a minority interest in Tunnel Glucose Refineries.

The broader relationship will provide a means for new products coming from Staley's expanded research program to be produced and marketed by the Belgian and British companies in the Common Market countries and the United Kingdom.

Antara Appoints Distributors

The following companies have been appointed as distributors by Antara Chemicals, a division of General Aniline & Film Corp.

Hooseir Solvents & Chemicals Co. (of 1650 Luett Ave., Indianapolis, Ind.) will handle certain IGEPAL surfactants and the CHEELOX chelating and sequestering agents through the state of Indiana.

Central Solvents & Chemicals Co. (of 2540 West Flournoy St., Chicago, Ill.,) will handle certain IGEPAL surfactants and the CHEELOX chelating and sequestering agents for a considerable territory, including Northwestern Indiana, Northern Illinois and Eastern Iowa.

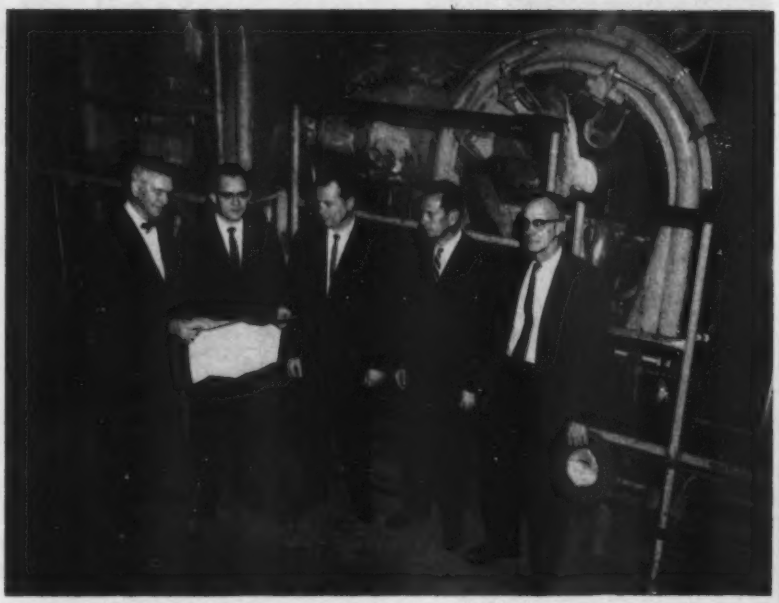
Wisconsin Solvents & Chemicals Co. (of 1719 So. 83rd St., Milwaukee, Wis.) will handle certain IGEPAL surfactants and the CHEELOX chelating and sequestering agents for a considerable territory which includes the state of Wisconsin and upper Michigan.

Jamesbury Valves Used at St. Joe

The Jamesbury Corp. of Worcester, Mass., has reported that the company's "Double-Seal" ball valves are finding extensive application for controlling the discharge of digesters in paper mills.

St. Joe Paper Co. of Port St. Joe, Fla., utilizes ten digesters (each with a capacity of 4300 cu. ft.) A Jamesbury ball valve, air-operated and remotely controlled from the digester operation floor, is fitted to each digester and facilitates the discharge of kraft pulp from each digester in eight minutes.

According to Jamesbury, the unique "Double-Seal" principle also allows for leakproof performance and quarter-turn operation, two highly important adjuncts to the efficient control of media flow in paper processing.



Left to right are: D. R. Morrison, superintendent of mill No. 1; D. J. Goodman, general superintendent of papermaking; D. M. Yost, research and technical director; Carl H. Eisenmenger, vice president of operations and I. D. Sisson, chief engineer.

Sorg Paper Installs Rotoformer Wet End

Sorg Paper Co. of Middletown, Ohio, has recently installed a multi-unit Rotoformer wet end on its No. 2 machine. The new Sandy Hill Iron & Brass Works' Rotoformer is a three-unit arrangement and replaces a conventional five-vat wet end.

Sorg's No. 2 produces tag stock, cover stock, telephone book cover and a variety of specialty sheets of similar character. In a search for new and better ways of forming cylinder papers, Sorg found that the Rotoformer offered advantages over other conventional methods.

About a year ago, a single Rotoformer was installed on No. 2 to replace one vat. The satisfying results of this installation convinced Sorg's staff that three Rotoformers could replace the five conventional cylinder vats.

After considerable study it was found that the use of three Rotoformers effected a saving in space which could be used for additional drying or the spreading of the press section. It was then decided that a new Patton press section and the new Rotoformers would be installed at the same time.

The three Rotoformers are arranged so that the paper travel is always toward the dry end. The first sheet is picked up farthest from the dryers and progresses in the same direction through the press section. The control of sheet dryness permits the operation of a single Rotoformer without any pickup felt and makes it possible for Sorg to produce a sheet on either one, or two or three Rotoformers. A Dynamatic drive, supplied by Eaton Mfg Co., drives each Rotoformer independently. Speed is controlled by adjustments in the eddy-current coupling controls.

From experience at Sorg, Sandy Hill believes that it may be possible to eliminate such things as suction drum presses and reduce the number of primary presses in a board set-up.

Container Establishes Plant in Texas

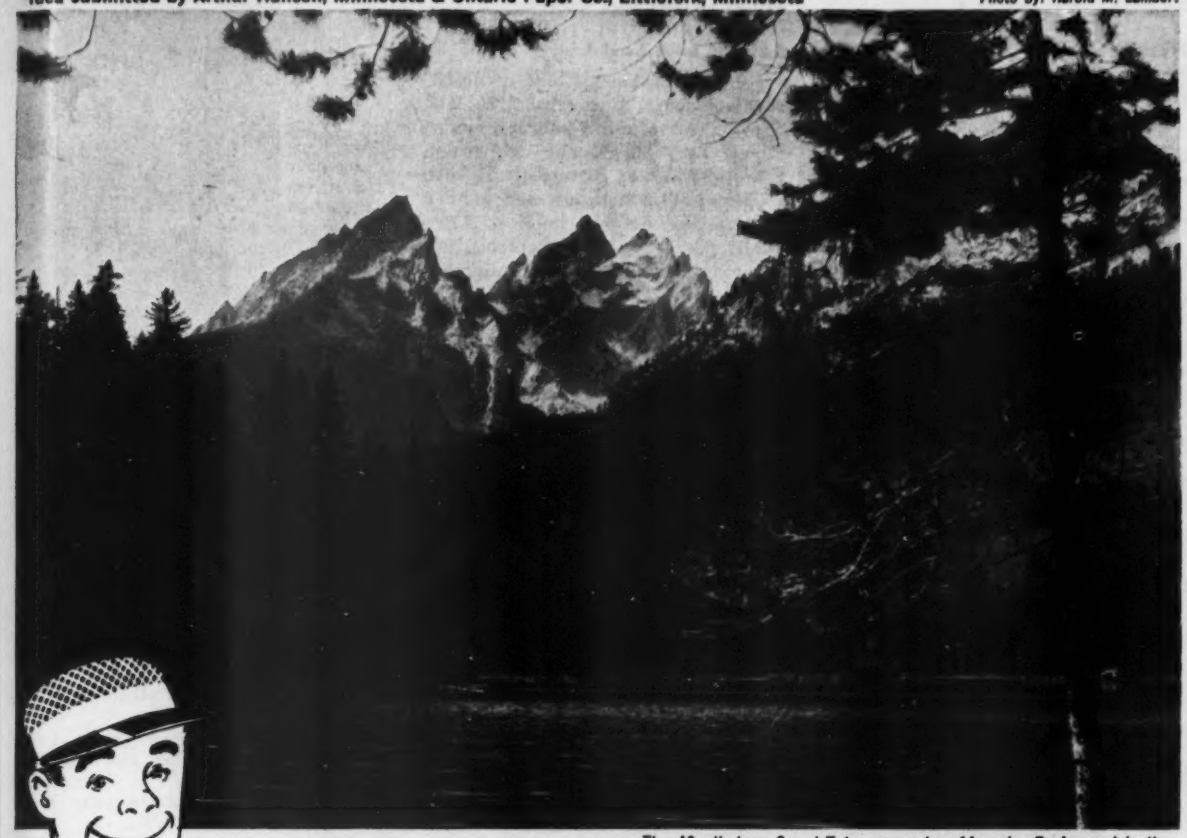
A new plant to manufacture corrugated paperboard packaging products has been established in Houston, Texas, by Container Corp. of America, Chicago, Ill.

Container has signed an agreement leasing a building which the Mabray-Nesmith Co. has just completed. The plant is a one-story building and will be equipped with a printer slotter, die cutting, taping, gluing and stitching equipment, and

Continued on page 46

*Idea submitted by Arthur Hanson, Minnesota & Ontario Paper Co., Littlefork, Minnesota

Photo by: Harold M. Lambert



The 40-mile-long Grand Teton range has 11 major **Peaks**, and is the most **Spectacular** portion of the Rocky Mountains in Wyoming.

HAM FELTZ says:

"Reminds me that HAMILTON Felts are a help to peak production, spectacular savings!"

YOU CAN'T BEAT

Hamilton

FELTS

*WIN... *A NEW Shakespeare Spincast Fishing Outfit!*

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each idea from a U.S. papermaker that we use wins a new 1961 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. Every U.S. papermaker *entrant* receives a famous Rex Spoon fishing lure — FREE. Send me your suggestion — today.

Ham Feltz, 612 First National Bank Bldg., Dept. I
Cincinnati 2, Ohio."

"Hamilton Felts can help *you* realize peak production, spectacular savings and increased profits, because they're 'water-conditioned' — especially designed, carefully woven and porosity proven — for faster water removal, so they'll deliver drier sheets to the driers, permit operators to run machines at higher speeds . . . longer . . . turning out more tonnage, with fewer stops and less broke or imperfections.

"Ask your Hamilton Felts Service Salesman about our 300 proven styles. If one of our 'standard 300' won't solve *your* needs, we will be happy to design a Hamilton Felt that will."

SHULER & BENNINGHOFEN, HAMILTON, OHIO

For more data circle 125 on Post Card

NEWS OF THE INDUSTRY

Continued from page 44

will produce a complete line of corrugated packaging products.

Administration of the plant will be under the direction of the company's Fort Worth personnel: L. M. Cutter, general manager; B. B. Gant, sales manager; and S. O. Baughman as plant manager.

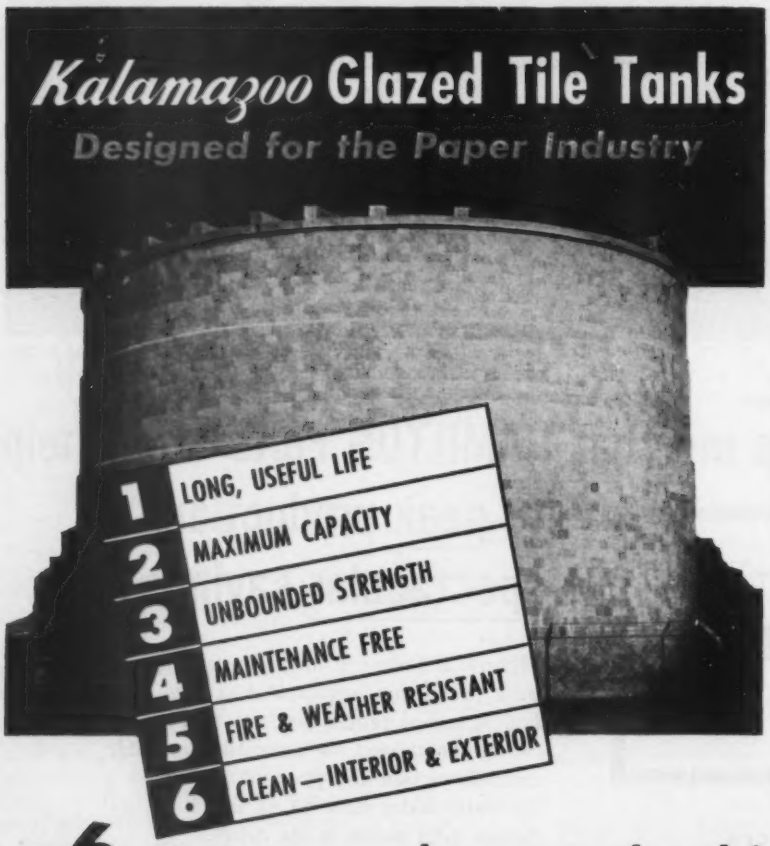
The company presently operates a corrugated shipping container plant in Fort Worth and a folding carton plant in Arlington, a few miles east of Fort Worth.

Joliet Equipment Offers Motor-Generator Sets at Low Cost

Joliet Equipment Corp. of Joliet, Ill., has acquired several "250 KW Surplus Motor-Generator sets" which are late model drip-proof, General Electric, factory-made sets.

These sets, which are said to have cost in the neighborhood of $20,000.00 per set without controls, are being offered by Joliet Equipment at a price under $10,000.00, including controls. The company states that these sets are rebuilt and guaranteed for one year.

Further information on these sets is obtainable from Joliet Equipment Co., Box 1078-I, Joliet, Ill.



6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

For more data circle 126 on Post Card

Coming Events

TAPPI

May 4 — Pacific Coast Division, Tri-way meeting (PIMA, CPPA, and TAPPI), Harrison Hot Springs Hotel, Harrison Hot Springs, B.C., Canada.

May 8-10 — 12th annual TAPPI Coating Conference, Buffalo, N.Y.

May 10-12 — Pulp and Paper Instrumentation Symposium, Northland Hotel, Green Bay, Wis.

May 25 — Recognition Night, (with PIMA), Gull Harbor, Richland, Mich.

June 20 — Fun Day (with PIMA), Gull Lake Country Club, Richland, Mich.

PIMA

April 21 — New York-Canadian Division, Eastman Kodak Co., Kodak Park, Rochester, N.Y.

April 22 — Ladies Night, Hotel Harris, Kalamazoo, Mich.

May 4 — Pacific Coast Division, Tri-Way Meeting (PIMA CPPA, and TAPPI), Harrison Hot Springs, B.C., Canada.

May 11-13 — Pennsylvania-New Jersey-Delaware Division, Yorktowne Hotel, York, Pa.

May 25 — Recognition Night (with TAPPI), Gull Harbor Inn, Richland, Mich.

June 7-9 — National Meeting, Hotel Robert Meyer, Jacksonville, Fla.

June 20 — Joint Meeting with TAPPI, Gull Lake Country Club, Gull Lake, Mich.

OTHER MEETINGS

May 1-5 — Ninth Annual Meeting of the American Society of Training Directors, Bellevue-Stratford Hotel, Philadelphia, Pa.

May 2-9 — Sixth Packaging Exhibition, RAI, Amsterdam, Holland.

May 9-11 — Trade Show and Technical Conference, Material Handling Institute Inc., Philadelphia Trade and Convention Center, Philadelphia, Pa.

May 22-25 — Design Engineering Show, Cobo Hall, Detroit, Mich.

May 28-June 1 — 1961 Annual Convention of the Special Libraries Association, Sheraton-Palace Hotel, San Francisco, Calif.

June 7-9 — Summer Meetting, CPPA, Saranac Inn, N.Y.

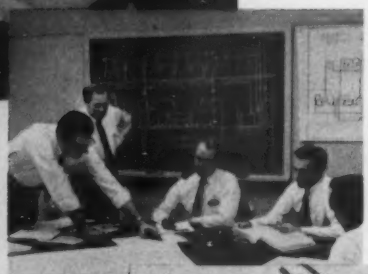
June 22-23 — Seventh Annual Conference on Electrical Engineering, Pulp and Paper Industry Technical Conference, Western Michigan University, Kalamazoo, Mich.

June 28-30 — 1961 Joint Automatic Control Conference, University of Colorado, Boulder, Colo.

August 9-11 — Wood Chemistry Symposium, 18th International Congress of Pure and Applied Chemistry, Montreal, Canada.

THE SEVEN STEPS OF JONES SYSTEM ENGINEERING

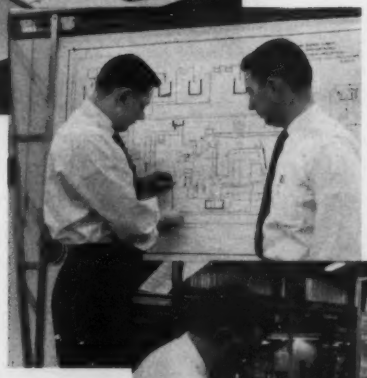
1
Data Gathering



2
Establishing Specifications

3
Laying Out the System

4
Preparing the Proposal and Cost Estimate



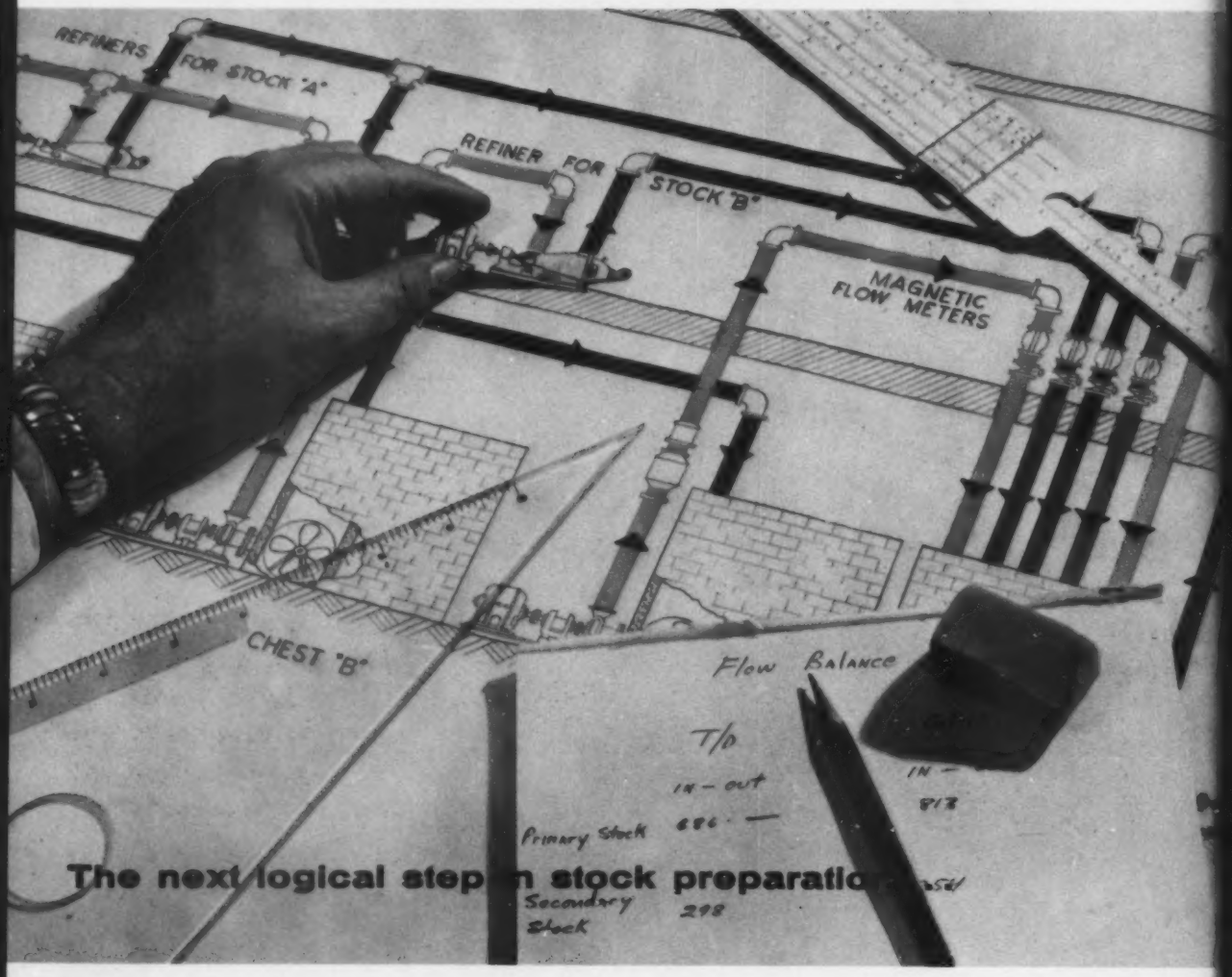
5
Detailed Engineering and Supervision of Manufacture

6
Supporting Services

7
Training Mill Personnel and Start-Up of System

Step by step, Jones relies on a combination of thorough planning, competent engineering, and teamwork to design and produce stock preparation systems that meet the highest standards of performance and dependability.

THE INTEGRATED STOCK PREPARATION SYSTEM



For a number of years E. D. Jones has been working toward the concept of an *integrated* stock preparation system . . . a system where each separate component works in complete harmony with every other component to function as *one single machine.*

E. D. Jones is now ready to supply paper mills with integrated stock preparation systems, for either modernization programs or completely new mills. Custom designed in conjunction with mill personnel (including their chosen consultants) for specific applications, these systems offer the following unique advantages to forward-looking papermakers:

UNIT RESPONSIBILITY. One source for contract negotiations, liaison during manufacture, start-up assistance, and future systems service.

FASTER PROJECT IMPLEMENTATION, resulting in earlier start-up.

LOW EQUIPMENT COSTS, because major components are selected from the wide range of regularly manufactured Jones equipment — all competitively priced.

LOWER OPERATING COSTS, because of efficient, carefully matched, easy-to-maintain components.

GREATER FLEXIBILITY FOR THE FUTURE, because a JONES system is designed to meet tomorrow's requirements . . . as well as today's.

For further information, write to:

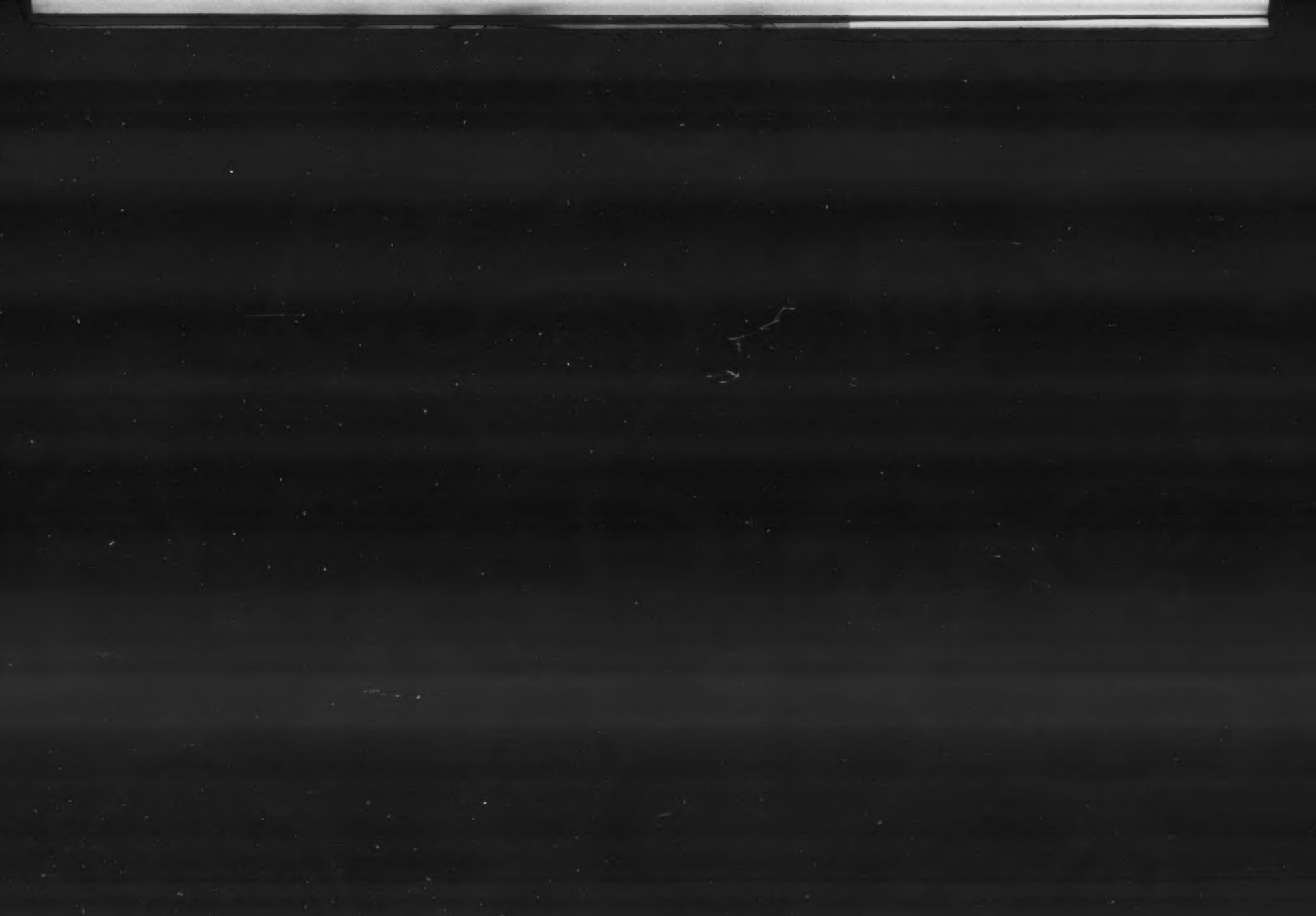
Systems Engineering Group
E. D. Jones Corporation
Pittsfield, Massachusetts

Canadian Associates:
The Alexander Fleck Ltd. • 75 Spencer Street, Ottawa

E. D. JONES CORP. member BELOIT group PITTSFIELD, MASS.

Jones

PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY



CURRENT COMMENTS

Continued from page 40

Rap-In-Wax Co. of Minneapolis, a flexible packaging concern, has formed a European subsidiary, *Rap-In-Wax A.G.*, to be headquartered in Zug, Switzerland. The subsidiary has acquired an interest in *Rationelle Verpackung*, a packaging and chrome-coated paper supplier located near Zurich. The Rationelle plant is valued at more than $1,250,000.

Johns-Manville Corp. has agreed to buy two asphalt roofing plants at Cleveland, O., and Madison, Ill., and a dry felt mill at Avery, O., from the *Celotex Corp.* of Chicago. Celotex said it would continue in the asphalt roofing business on the West Coast, where it has an asphalt roofing and felt mill at Los Angeles.

Thor Power Tool Co. of Aurora, Ill. has bought control of Italy's largest manufacturer of air tools, *Fabbrica Italiana Apparecchi Pneumatici*. Thor has also acquired a substantial minority in a Spanish company, *FIAP ESPANOLA* located in Barcelona, Spain. The extent of the Spanish interest was not disclosed.

Babcock & Wilcox Co. of New York, has signed an agreement with the *Isolite Insulating Products Co. Ltd.* of Osaka, Japan, which permits the Japanese concern to manufacture and sell B&W's entire line of refractories. The pact covers a ten-year period, dating from January 1961.

Net incomes

West Virginia Pulp & Paper Co. — Earnings for the January quarter slipped to $1,692,000 from the $2,414,000 recorded in the similar fiscal quarter a year ago, but sales rose to a record $60,177,000 from $56,871,000 recorded a year ago. Lower prices and heavy start-up costs for new equipment were factors in the profit decline.

Celotex Corp. — Income for three months ended January 31, $91,747; a year ago, $211,522.

American Writing Paper Corp. — Income for 1960, $583,733; a year ago, $641,434.

Certain-Teed Products Corp. — Income for 1960, $2,346,048; a year ago, $3,374,549.

Kimberly-Clark Corp. — Income for nine months ended January 31, $22,337,639; a year ago, $22,195,927. Sales increased totaling $305,821,498 as compared with $294,835,640 a year ago.

Federal Paper Board Co. Inc. — Net earnings in 1960, $4,000,000; a year ago, $5,164,000.

Diamond National Corp. — Income for 1960 rose to $12,706,000 from the 1959 figure of $10,997,000.

Great Northern Paper Co. — Income for 1960, $3,113,000; a year ago, $1,848,000.

Nekoosa Edwards Paper Co. — Income for 1960, $2,450,000; a year ago, $3,020,000. Sales hit an all-time high of $45,600,000.

P. H. Glatfelter Co. — 1960 net income, $2,373,800; a year ago, $2,988,128.

Chesapeake Corp. of Virginia — Net income for 1960, $3,897,604; a year ago, $3,909,640.

Packaging Corp. of America — Net income for six months ended December 31, $2,049,824; a year ago, $3,244,393.

Financial note

February saw an almost universal increase in quotations for paper mill securities, especially common stocks, in general accord with the general bullish tone of the market. Scott Paper led the advance with a gain of $10 per share for the month, with Certain-Teed gaining $6 and several other paper issues in the neighborhood of $4 each.

Stock and Bond Quotations

New York Stock Exchange

Closing Prices	March 10, 1961	February 10, 1961
American Can	37⅛	35¾
Same Pref.	37¼	37⅞
Celotex	30	28½
Same Pref.	* 18½-19	17½
Certain-Teed	38⅞	32½
Champion P&F Co.	32⅝	28⅜
Same Pref.	91⅞	92½
Chesapeake of Va.	36	34
Container	28½	27⅛
Same Pref.	* 92½-94½	* 93½-96
Continental Can	38	38⅜
Same Pref	82¾	85
Crown Zellerbach	56½	54
Same Pref.	—	91½
Diamond Nat.	45⅛	40¾
Same Pref.	—	* 31-31⅜
Federal Paper Board	41	36
Same Pref.	* 23-23½	* 23-23¾
Fiber Paper Board	31⅞	29¼
Great Northern	59⅛	55
Hammermill	29¼	29½
International	33½	34
Same Pref.	* 94½-96	* 93⅜-94¼
Kimberly Clark	92	92⅜
KVP Sutherland	37⅛	34¼
McAndrews & Forbes	30¼	29¾
Masonite	34	32¼
Mead Corp.	43⅛	39⅜
Same Pref.	* 90-91½	* 89½-91
Minn. & Ont.	32¾	31¼
Nat. Vulc. Fib.	21¾	21½
Oxford Paper	30	32
Same Pref.	93	91½
Rayonier	19⅜	19⅜
Riegel Paper	29½	* 28 28½
St. Regis	39¾	38⅝
Same Pref.	96	* 91-94
Scott Paper	104¾	94½
Same $4 Pref.	91	91
Same $3.40 Pref.	* 75-76½	* 76½-77¼
Sealright	35¾	35½
Standard Packaging	25¾	24⅜
Same $1.60 pref.	* 72-79	72
Same $1.20 Pref.	31¾	29
Same 6% Pref.	30½	28¾
Union Bag-Camp	35¾	37⅛
Union Bd. & Carton	20⅝	19⅝
U.S. Gypsum	109	106⅛
Same Pref.	*152½-155½	154½
West Va. P&P	39⅝	38¾
Same Pref.	* 97½-98⅝	* 95½-97

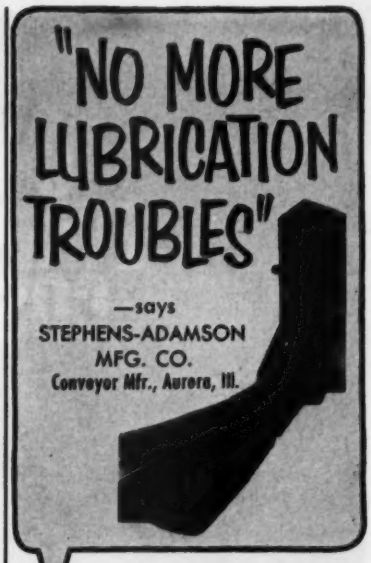
New York Stock Exchange — Bonds

Champion P&F Co. 4½%	111	109
Champion P&F Co. 3¾%	92½	96
Diamond Gardner 4%	—	92
Kimberly Clark 3¾%	94½	94½
Oxford 4¾%	110	111
Scott 3%	135	128

American Stock Exchange — Stocks

Allied Paper	8⅞	11½
American Writing	32¼	31⅞
Brown Co.	14⅛	13⅛
Puget Sound	23⅛	23

*Bid and Asked Prices



"LUBRIPLATE Lubricants satisfy the 'one-shot' requirements of our conveyor idlers. LUBRIPLATE effectively lubricates each bearing in turn and flows through the hollow shaft to the next bearing. We do not know of a single case of bearing trouble through faulty lubrication where LUBRIPLATE has been used."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

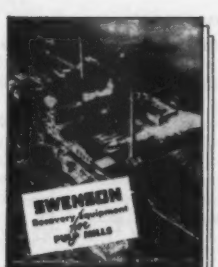
For more data circle 128 on Post Card

YOU CUT EVAPORATOR COSTS HERE

inside your pulp washer drum!

A better hydraulic system resulting in more effective use of drum surface is the principal reason why Swenson pulp washers require less dilution to obtain clean pulp. And lower dilution means lower evaporator costs.

Swenson pulp washers pick up a thicker sheet of pulp, permitting lower drum speeds and greater drainage time. The patented Swenson channels are sloped to the center with liquor drainage on both the leading and trailing sides. These features provide the most effective use of the drum area assuring low dilution operation.



SEND for more FACTS on the cost-cutting Swenson pulp washer. Write for bulletin E-108, "Pulp Mill Equipment", today. ***Swenson Evaporator Company, 15653 Lathrop Ave., Harvey, Illinois. In Canada: Whiting Corporation (Canada) Ltd., 350 Alexander Street, Welland, Ontario, Canada.***

PROVED ENGINEERING FOR THE PROCESS INDUSTRIES SINCE 1889

SWENSON

A Division of WHITING Corporation

WHITING-MANUFACTURERS OF CRANES; TRAMBEAM® HANDLING SYSTEMS; PRESSUREGRIP; TRACKMOBILES,® FOUNDRY, AND RAILROAD EQUIPMENT

For more data circle 129 on Post Card

Albany Felt Co.

James E. Smith, sales manager of Albany Felt Co., Albany, N.Y., for the past five years, has been appointed vice-president and general manager of Albany Felt Co. of Canada Ltd.

Samuel Van Praag has been named sales manager for felts manufactured in the U.S. His headquarters are in Albany, N.Y.

Appleton Wire Works Corp.

W. E. Buchanan Jr. has been appointed southeastern sales representative of this company. Buchanan will reside in Montgomery, Ala., and has established offices in the company plant in that city.

W. E. Buchanan

G. M. Anderson

Penick & Ford Ltd.

G. M. Anderson has been promoted to the position of assistant manager of the Corn Refining Division of this company with headquarters in Atlanta. The scope of his assignment covers sales and service activities in the paper industry. He was formerly manager of the Textile Division of Technical Sales Service and Field Development.

Antara Chemicals

Larrie S. Calvert has been assigned to cover the chemical sales territory in St. Louis and Kansas City, Mo. He succeeds J. A. Czerwinski who was assigned to a new territory on the West Coast.

Following the recent creation of a new technical department, Dr. F. J. Gajewski, technical director, announces that Clement H. Nichols has been named manager of the technical engineering department, and Dr. Robert C. Wilson has been appointed manager of the technical research department. Both will remain in Linden, N.J.

Dr. J. F. Mulvaney, recently named manager of the Linden plant has announced that Curtis L. Collison is manager of personnel relations; Ernest Kuhn is production manager — Surfactants and Intermediates; Clyde W. Meder is plant controller; Dr. James C. Moran is production manager — chemical specialties; Dr. James B. Normington is manager — quality control; and Herman H. Tiedemann is production manager — heavy chemicals.

A. E. Staley Mfg. Co.

Owner W. O'Neill has been named chemical sales supervisor of the A. E. Staley Mfg. Co., Decatur, Ill. O'Neill has been with Staley for three years.

Nat Kessler has been named director of process engineering and Roger J. Mauterer succeeds him as chief chemical engineer.

Alan R. Kimball has been promoted to assistant manager of the Atlanta, Ga., branch office of the company's sales department.

John F. Krause has been named Cleveland branch manager; Alfred W. Brunlieb will become industrial products manager; and Harland H. Harroun is grocery product manager.

Donald L. Winter has been named a technical assistant in the Corn Division at Decatur.

International Paper Co.

John F. Howden, vice president of this company, has been named president of the new overseas division which has been organized to direct and coordinate the firm's ex-

St. Regis Paper Co.

Dr. William R. Haselton, now vice president and general manager of the Rhinelander Paper Co. Division, will succeed Jack M. Lamb as general manager — Tacoma, Wash., area operations, when Lamb retires in June. Lamb will continue as a consultant to the company.

Willmer J. Davis, vice president in charge of sales at Rhinelander, will succeed Dr. Haselton as vice president and general manager there. He, in turn, will be succeeded as vice president by Charles C. Johnson, who is now sales manager at Rhinelander.

S. Kepple Pratt, resident manager of the Tacoma pulp and paper mill, will become manager of kraft pulp and paper manufacturing. Pratt will make his headquarters at Jacksonville, Fla.

Robert F. Lynch, now manufacturing superintendent at Tacoma, will become production manager there.

J. M. Lamb

W. R. Haselton

S. K. Pratt

W. J. Davis

ports of paper and paperboard interests in overseas production operations.

Nichols Engineering & Research Corp.

George G. Wurtmann has been appointed assistant manager of the Nichols Pulp & Paper Division. Wurtmann has been associated with the pulp and paper field since 1952.

G. W. Wurtmann

W. H. Aiken

Union Bag-Camp Paper Corp.

Dr. William H. Aiken has joined Union Bag-Camp Paper Corp., New York, N.Y. as director of research and development. Aiken previously directed research and development for Gardner Board & Carton Co.

Chillicothe Paper Co.

Richard H. Green has been appointed technical director of Chillicothe Paper Co. In his new position, Green succeeds Harold Hixon who returns to his former position in the technical service department at Chillicothe, Ohio.

Olin Mathieson Chemical Corp.

Leon H. Garfield has been appointed production manager for the carton operations of the Packaging Division of Olin Mathieson Chemical Corp., New York, N.Y. Garfield's office is located at the company's new carton plant in West Monroe, La.

Weyerhaeuser Co.

W. Q. Reiniger, manager of Longview Fibre Co.'s Los Angeles, Calif. box plant, has been promoted to vice-president of General Fibre Box Co. of Springfield, Mass.

Roy B. Slotten, who started in the Longview box plant and is presently superintendent of the Oakland box plant, will become manager of the Los Angeles box plant.

Gordon E. Richards, general foreman at the Oakland, Calif. box plant, has become superintendent of the operation.

J. R. Callahan Jr., has been serving as assistant branch manager at Longview, Wash. He will become production manager-board.

Andrew A. Broz, who has held the post of technical director of Everett Sulphite mill, will become production manager — pulp at the Longview branch of Weyerhaeuser.

Robert M. Knight was assistant technical director at the Everett sulfite mill, will become technical director succeeding Broz.

Lodding Engineering Corp.

Joseph S. Cooper was recently appointed field service manager by Lodding Engineering Corp., Auburn, Mass. Cooper has had 15 years experience with the company in nearly all phases of the business. In this capacity he has visited mills and gained experience in the installation, servicing and evaluation of the company's products.

J. S. Cooper

T. C. Catlin

Riverside Paper Corp.

Thomas C. Catlin has been appointed mill manager of Riverside Paper Corp., Appleton, Wis. Catlin has been employed by Marathon Corp. in Menasha, Wis. and Gilbert Paper Co. He is a member of TAPPI and the technical committee of the Writing Paper Association.

Kimberly-Clark Corp.

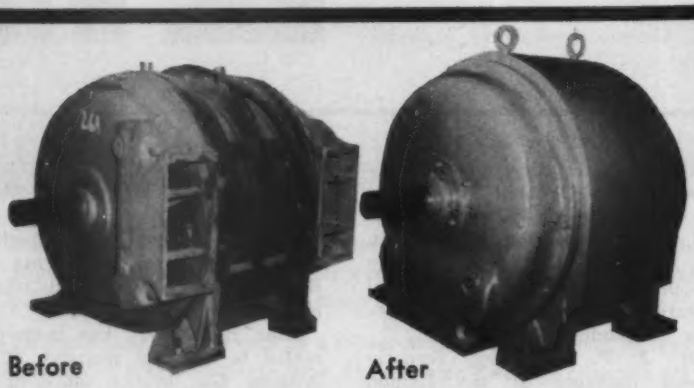
W. C. Cross has been named president of Kimberly-Clark International, S. A., to head the foreign operations of the company.

W. B. Meyer was named to succeed Cross as sales vice president of the industrial products division. Cross will continue as a vice president of the parent firm.

Abitibi Power & Paper Co. Ltd.

T. C. Anderson has been appointed to Toronto Development and Planning staff as project manager for Abitibi Power & Paper Co. Ltd., Toronto,

continued on page 70



This motor is now mounted to a Jordan in the East. The Rebuilding job at JEC is complete . . . but the JEC guarantee continues for a year.

REJUVENATION

• The motor, which originally had a special shrouding, was equipped with a standard housing and a high temperature winding. Also it was completely cleaned and rebuilt.

PAPER MILL APPLICATIONS ARE A SPECIALTY AT JEC.

• Whether you need distribution systems, beater motors or specially engineered sectional drives — Joliet Equipment Corporation, can do it at a price that you can afford.

SEND YOUR INQUIRIES TO

JOLIET EQUIPMENT CORPORATION

GROSS STREET, BOX 1078-I, JOLIET, ILLINOIS

PHONES: Joliet — SAratoga 7-4738 Chicago — Bishop 2-2458

JEC

For more data circle 130 on Post Card

Stretch in paper

The authors developed an instrument for studying the rheological properties of paper, which was used in the investigation of elongation. The samples included sheets made from the following pulps: unbleached spruce sulfite, mechanical pulp, semi-bleached pine kraft, bleached straw pulp, bleached beech sulfite, bleached aspen sulfite and semichemical birch pulp. Extensive analytical and physical data are given.

In the present study the moisture range varied from wet sheets to those that had been air-dried, with a series of intermediate stages as well. The dimensional changes that occurred were not controlled externally; (**i.e.** no outside tensions were used). The stretch was contingent on the type of pulp used, its physical properties and on the degree to which it was beaten in a Jokro mill. The relative amounts of long and short fibers and fines in the stock, also had their effect. The stretch was due apparently to a combination of an elastic reversible and an irreversible plastic elongation. As drying proceeds, the stretch at rupture, is normally decreased. To a lesser degree this is also true for the elastic elongation. As the sheets dry, and the breaking length increases, the elongation at rupture decreases. There is never any absolute correlation between these two, at any moisture content. The initial wet strength of a sheet could not be judged from its initial stretch. Throughout the entire range of moisture content, the conformation of the fibers (**i.e.** twisting, curling, or crimping) had a significant effect on the elongation. It depended in part on the degree to which curled fibers were straightened out. The stretch, which usually showed a decrease (up to 70 per cent dry weight) usually showed a subsequent decrease, between 70 and 90 per cent dry weight. The uniformity of the sheet had a marked bearing on its stretching properties. Sheets that were dried and then remoistened gave extensibility data that were different from those shown by sheets that had never been dried even in those from the same stock. The rewetted sheets showed lowered extensibility. Usually beating increased the "stretch", except when the moisture content was very high.

Walter Brecht and Horst Erfurt. **Das Papier 14,** 723-36 (1960) (In German).

Studies on groundwood requirements in Czechoslovakian newsprint

The newsprint in a mill showed that on a newsprint papermachine operating at about 300 meters per min. any groundwood content above 70 per cent gave rise to frequent web breaks on the suction couch and wet presses. A detailed study of all steps in the manufacturing operation and properties of the mechanical pulp followed. The groundwood used had a high tensile strength (with a breaking length of 3154 meters) but a relatively low freeness. It was beaten to 78 deg. Schopper-Riegler. Even when the groundwood laps were dried and stored they retained high mechanical strength.

Two foreign newsprint samples were then explored. These had a low breaking length (of 1731 meters) and a groundwood content of 85 per cent. These foreign newsprints were studied microscopically, and it was shown that in one case the ratio of the average length of the fibers to their width was 13.1; in the other it was about 6.5. However in the case of the Czech newsprint this ratio was only about 4.7 despite the fact that it had a much higher (dry) tensile strength. On the other hand the wet tensile of both of the foreign stocks was much higher than that of the Czech newsprint. Hence certain technological changes were recommended.

It should be added that the equipment of the mill was shown to be in very satisfactory operating condition. Suggestions included the replacement of continuous beaters and conical refiners by refining equipment that would give a more homogeneous pulp, and it appeared that Supratonators were suited to this purpose. The quality of the mechanical pulp was also improved by increasing the temperature of grinding by 10° to 15°C. and by reducing the degree of beating to 65-70° Schopper-Riegler, so as to increase the long fiber fraction.

Josef Pollak. **Sbornik Vyzkumnych praci z oboru celulosy a papiru** 3, 117-43 (1958) (Original in Czech, with Russian, Eng. and German summaries) through **Abstr. Bull. Inst. Paper Chem.** 31, No 6, 844-5 (1961).

Yellowing of pulps and papers

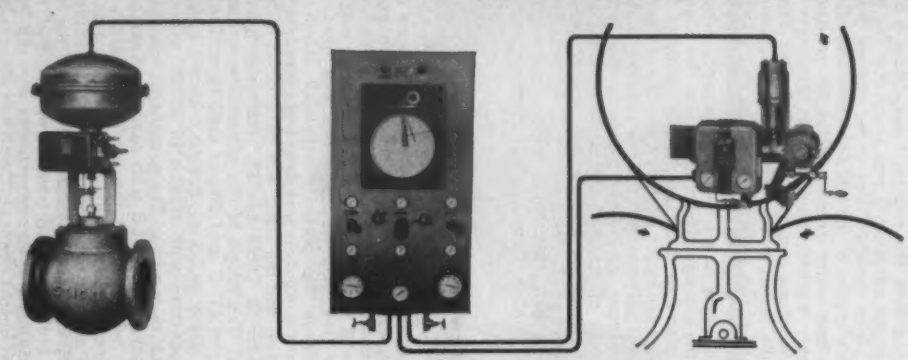
This is the third in a series of studies; abstracts of the first two were given in THE PAPER INDUSTRY, 41, No 11, 814-15 (1960). All of these deal with certain fundamental aspects that are of interest in pulp (color) reversion. When impregnated with solutions of sugars or sugar derivatives, purified linters do not act simply as inert fibers but are themselves affected. If, under such conditions the linters are aged artificially, yellowing occurs, which is due to acid (or other) components derived from the sugars; these cause a hydrolytic degradation of the cellulose. It was found that the yellowing was greater under nitrogen than under oxygen, but the degree of polymerization of the cellulose was less affected under nitrogen than under oxygen. When the yellowed linters were thoroughly washed, much of their brightness returned. All of these reactions are discussed at length. The marked changes in the linters occur only when the "pseudo aldehydic function" of the sugars is free. The degradation of the linters is greatest when the number of secondary hydroxyl groups in the sugar is greatest. For example, when xylose was used in the impregnation of the linters, this sugar caused more degradation than did its methylated products. The higher the initial concentration of the xylose, the greater was the loss in degree of polymerization of the cellulose in the linters. Atmospheric oxygen also plays a role in the degradation, due to formation of carbonyl and carboxyl groups, but this is the role of depolymerization rather than of yellowing.

Twelve references. A. Roudier and G. Sauret. Assoc. tech. ind. apapetiere, **Bull. 1960,** No 2, 52-65. (Original in French, with German, English, Spanish and Italian summaries.)

Determination of starch in paper

The author found difficulties in obtaining reproducible results by using methods described in the literature for determining starch in paper, so he devised a technique of his own, which also involved a well-known micromethod for the determination of reducing sugar. A pancreatic amylase that is practically free from carbohydrates was used, and this served to remove the partially degraded starch from the paper. This starch solution was then hydrolyzed further, with acid, to glucose, and the latter was determined quantitatively. The amylase is "Diaferman KL" (obtained from Diamalt A.G., Munich). Ten grams of this material were dissolved in 100 ml. water at 45° C. and filtered until clear. The paper to be analyzed (0.6 g. to 1.0 g.), having a known moisture content, was macerated with stirring in 20 ml. water and refluxed one half to one hour. The suspension was then cooled to 45° and taken to pH 6.8 with dilute sodium hydroxide, treated 1 hr. with 1 ml. of the amylase solution, then retreated for another hour with 1.5 ml. and in cases of much starch, given another amylase treatment. The entire suspension was then filtered with gentle suction and the filter cake pressed out, broken up and treated twice with 20 ml. water at 50° C. and finally with boiling water until the iodine test for starch was almost negative. Combined filtrates and washings were refluxed 1.5 hr. with 5.5 ml. concentrated hydrochloric acid, neutralized carefully and diluted to exactly 250 ml. Using 5 ml. aliquots, the glucose in these was determined by the micromethod described by Hagedorn and Jensen (cf.

You Don't Need an Electronic Technician to Run This Moisture Control System . . .



DIAPHRAGM MOTOR VALVE

Engineered to fit individual steam requirements. Responds to the slightest change in moisture content of the sheet. No surging or cycling. Large diaphragm areas assure positive operation.

CONTROL PANEL

Houses all controls and two-pen recorder. Shows steam pressure in dryers and moisture variation in sheet as it passes over dryers. Tells the complete story of dryer operation at a glance.

MOISTURE DETECTOR

The new super-sensitive Stickle detector. Adjustable for any weight of paper—from .0003 to the heaviest board. Numbered dial permits quick setting of desired sensitivity.

It's the Most Simple, Trouble-Free System Ever Built . . . yet Maintains Any Moisture Content Desired within ½ of 1% in Any Weight of Paper from .0003 to the Heaviest Board

The new Stickle Pres-ten-trol uses the time-tested, mill-proven principle of sheet expansion and contraction to regulate steam flow to the dryers . . . provides instant regulation within present limits—with minimum fluctuation . . . records moisture variation of the sheet, steam pressure in dryers, time and duration of wet end breaks . . . maintains steam pressure desired when paper is off the machine. No other system costs so little to buy, install, operate and maintain because no other is so simple, so trouble-free. Write for Bulletin 460-C.

STICKLE STEAM SPECIALTIES CO.

2215 Valley Ave. • Indianapolis 18, Ind.

Stickle Equipment
Cuts the cost of steam

For more data circle 131 on Post Card

Biochem. Z. 135, 46 (1923) which was originally applied to blood-sugar analysis. (CF. also Bates **et al.** Circular C 440, National Bureau of Standards, P. 198-99 (1924). Full details of this determination as applied to the present method, are given. Precision is of the order of ± 5 per cent. Duplicate runs can be made within about 6 hrs., and determinations of 55 to 275 gammas of starch are possible.

Nine references. H. Feeser. **Allgem. Papier-Rundschau** No. 18, 1960, 1000-1000003. (In German).

Swelling of native celluloses

The author describes a new relatively simple x-ray absorption technique, which serves to give a deeper insight into the fine structure of fibrous materials like cellulose. A detailed account of the equipment was described by Ruck and Krassig [**Novelco Reporter** VII, No. 3, p 71 (1960), and in **Faserforschung u Textiltechnik** (in press)]. The claim is made that the new method, in certain respects, surpasses the usefulness of the electronmicroscope. Following swelling studies with linters and with wood pulps, the conclusion was reached that all the fibrous materials consist of microfibrils, which on swelling can be separated into "elementary fibrils" and that swelling may cause either a decrease or an increase in the specific surface, depending on whether the pulping process spared the primary wall of the fiber or destroyed it. Preferably the swelling process (including mercerization) should be termed an "inter-elementary-fibrillar" swelling. By comparing the results obtained with the new x-ray absorption technique with moisture sorption and density data, the reaction behavior of native celluloses has been clarified. For example, there is a definite relationship between the sorption of water and the change in average diameter of fibrils, and the author believes that there is no compelling reason for assuming that increased moisture sorption must be ascribed to the intramicellar structure of the cellulose. The interesting work of Howsmon and Marchessault (**J. Applied Polymer Science 1,** 313 (1959) is also reviewed, with special reference to decreases in degree of polymerization and increase in sorption of water with protracted grinding, as well as with changes in density. Apparently a maximum moisture sorption is reached at 14.5 to 15.6 per cent. These changes appear to be correlated with changes in fibrillar dispersion, which finally reaches a maximum.

67 references. Heinz Ruck. **Das Papier 14,** No. 10a, 495-509 (Oct 1960) (In German.)

The inspection of digesters

At the Vereins Zellcheming Meeting, held in Hochst, Germany, in 1960, two significant papers were presented on the inspection of digesters. The first dealt with techniques used in connection with older digesters; the second dealt with inspection methods used in Stockholm. The damage to digesters may be caused by the methods used in their manufacture, by the operational techniques used, and also by faulty digester linings. Rivet hole tears can be detected by the use of ultrasonics. In the first article, which is fully illustrated, stresses due to heating and pressure changes are shown both for a normal cook and for an "impulse" pressure digestion. Different types of rivet hole tears and lining damage are shown in half-tones, as are the instruments used in their detection. The life of the digester is greatly influenced by its lining, which even during a digestion must have been under sufficient prestress to avoid digester damage. Leaks in such linings can also be determined by ultrasonics. Ageing of the materials in digesters can be detected by notch-bar-impact tests. Here micro tests are important; little material is required. The article mentions the grave responsibility of an inspector who, on the basis of objective findings, is called upon to decide whether or not it is safe to use an old digester or not.

(1) Josef Wolff **Das Papier** 14, 665-70 (1960); (2) Karl-Erik Hogstrom, **Ibid** 671-3 (1960) (Both in German).

Papermaking properties of dense eucalypt woods

The effects of physical treatments and chemical additives on the kraft pulp obtained from Eucalyptus hemiphloia were studied. The problems resulting from the attempted use of dense, thick-walled hardwoods in pulping are outlined and experiments were made specifically with E. hemiphloia

Continued on page 68

Dr. Melvin Nord

Method of Making Printable Colored Paper

U. S. 2,949,382, issued Aug. 16, 1960 to Gilbert K. Dickerman, Frank Kaulakis, and Richard L. Savage, assigned to Consolidated Water Power & Paper Co., describes a method of making printable coated paper having a high degree of smoothness, brightness, opacity, and increased ink holdout.

In Fig. 1, numeral 10 indicates a paper web passing over the final drum dryers 11 at the dry end of a conventional paper making apparatus, such as that employing a fourdrinier wire. The

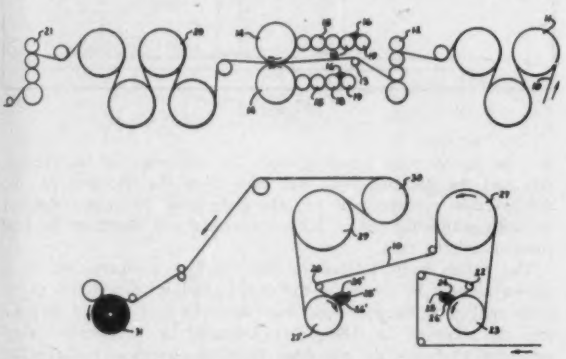


Figure 1

paper as it leaves the last drum dryer 11, in the present process, is substantially dry and has a moisture content of 5 to 8 per cent as it enters the nips of the calender stack 12.

On leaving the last nip of the calender stack 12, the web moves over the roll 13 where it is guided to and between the nip of the resilient surfaced rolls 14, 14 of the print or transfer type roll coater, where coating composition is applied to the opposed faces of the web 10 by transfer of preformed films from the rolls 14, 14 under the pressure of the top roll against the bottom roll of about 100 pounds per linear inch in the absence of loading, or with loading up to about 150 pounds per linear inch. The coating is transferred to each roll 14 through a series of distributing rolls 15 from pools of coating composition 16 metered in controlled amount by the gate rolls 18 and 19.

After the prime coated web leaves the transfer rolls 14, 14 it passes over a second set of drying drums 20 to dry the web to a moisture content of about 5-8 per cent, after which the paper web may be guided through a second calender stack 21 for minor smoothing or fiberlaying purposes.

After leaving the calender stack 21 the thus primed web 10 is then finish-coated with a second coating composition.

Thus, as the paper web advances it then passes to guide roll 22 where it is brought into contact with and moves downwardly against the face of the resilient surfaced roll 23. There it passes through a puddle or pool of coating composition 24 continuously maintained by an overhead supply (not shown) in the trough defined by the backing member or blade holder 25 to which there is secured the flexible blade 26. This blade resiliently bears against the exposed or outer surface of the paper web 10 as it passes downwardly in contact with the resilient surfaced roll 23 and through the pool of coating composition 24, the blade 26 serving to doctor or meter the coating composition 24 applied to the web 10. The pool of coating composition 24, which is continuously augmented as used, is maintained in agitated condition by its contact with the downwardly-moving exposed face of the paper web 10, so that the uniformity of the pool coating composition is constantly maintained.

After leaving the roll 23 the web 10 is dried to a moisture content of 5 to 8 per cent as it passes over drying drum 27.

When the web is to be coated on both sides it then proceeds continuously over a second resilient surfaced roll 23' to which it is brought into contact by the reversing guide roll 28.

The thus dual coated web is then brought into contact with another drying drum 29 with the freshly coated surface outermost, after which its coated surface may be brought into contact with a secondary drying drum 30. Added banks of lamps or air jets for secondary drying (not shown) may be employed if required.

The final drying of the web is to a moisture content of about 5 to 6 per cent, after which the web is guided to the reel 31 where it is wound up before being subjected to supercalendering.

The initial mineral-pigment coating composition has a relatively high adhesive content, so as to cover the fibers and fill the interstices of the paper to strengthen and prime it for the second step. In the second step the primed web is coated with another mineral-pigment composition, having a relatively low adhesive content, the latter composition remaining essentially on the surface of the pretreated paper where it is leveled to provide a smooth surface.

Incombustible Fiberboard

U. S. 2,944,930, issued July 12, 1960 to Arthur B. Bush, Jr. and Alice C. Weil, assigned to The Celotex Corp., describes a method of producing an incombustible fiberboard consisting principally of mineral fiber and including up to 40% cellulose fiber with a minor content of other ingredients. The fiberboard

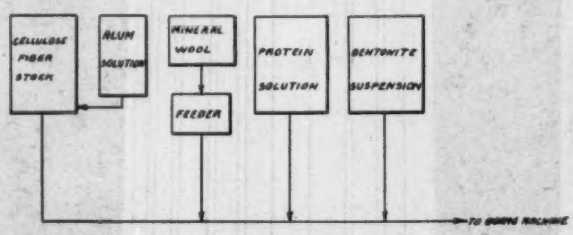


Figure 2

has good heat insulating and sound absorbing characteristics, as well as being incombustible and is a relatively rigid product capable of being shipped and handled readily.

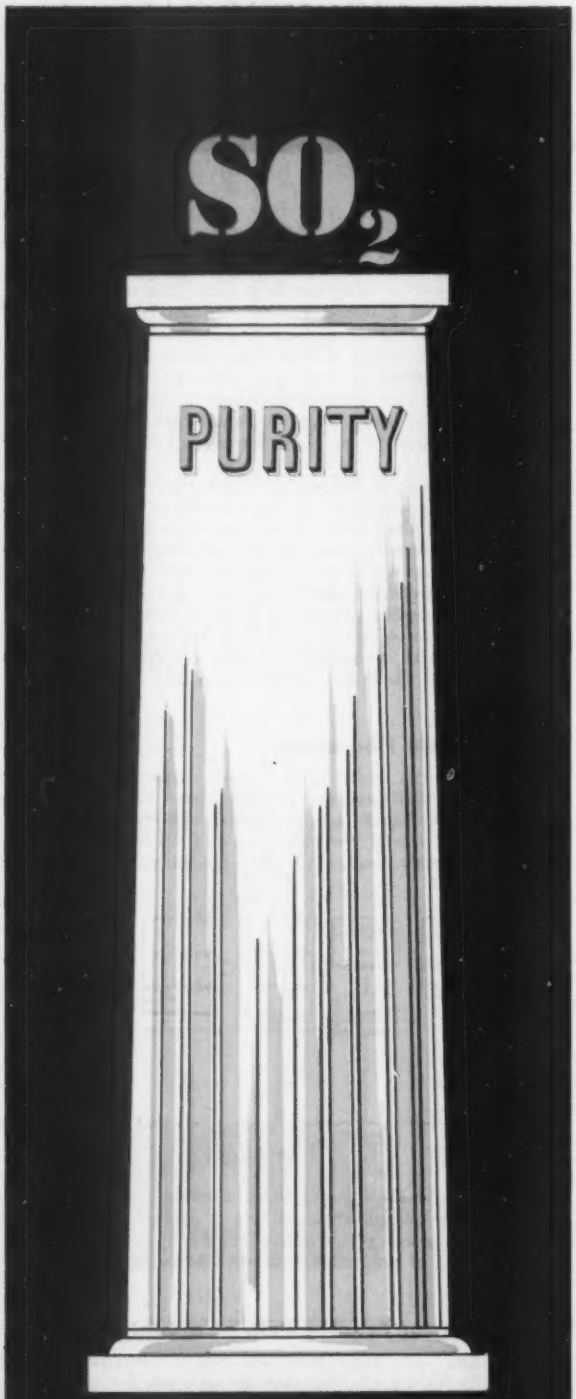
The method of production is shown schematically in Fig. 2.

Apparatus for Feeding Pulp at a Continuous Rate

U. S. 2,934,141, issued April 26, 1960 to Erkki Ikavalko and assigned to Valmet Oy, describes an apparatus for continuously feeding paper pulp at a constant rate into a paper making machine.

In general, this object is attained by feeding the pulp at a rate higher than a given rate into a chamber to form a pulp bath in the chamber, discharging the pulp from the chamber, in response to the pressure head of the pulp bath and the gas pressure acting on the bath, onto a supply conveyor of a paper making machine at a rate smaller than the given rate so that the level of the bath and the pressure head tend to increase, drawing off from the chamber excess pulp which tends to rise above a given level in the chamber in order to maintain the pulp bath constantly at the given level, and maintaining a constant gas pressure in the chamber above the bath.

As shown in Fig. 3, paper pulp is fed through the feeding means 2 and the inlet opening 3 into the chamber 23 of the



Our basic position enables us to control the purity of our chemicals from the raw material to the finished product we deliver.

To the Pulp Industry we offer a dependable source of highest purity Sulfur Dioxide.

TENNESSEE CORPORATION
612-627 Grant Building, Atlanta 3, Georgia

For more data circle 132 on Post Card

container 1. The feeding rate of the pump is adjusted in such a way that this rate is higher than the rate with which the pulp leaves the chamber 23 through the first outlet means 5. Therefore, a pulp bath is formed in the chamber 23 and when the pulp level 20 reaches the top edge 12 of the overflow partition 10,

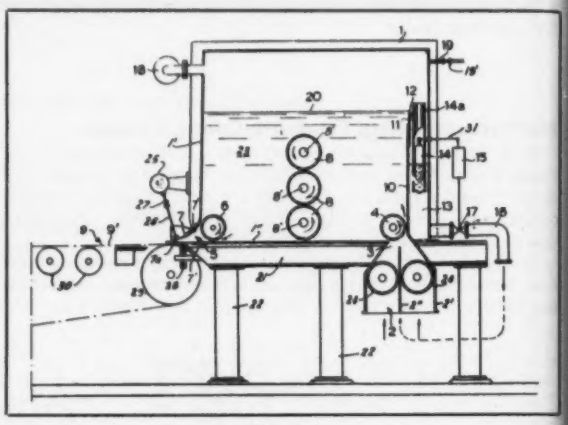


Figure 3

11, the excess pulp resulting from the difference in the feeding rate and the discharge rate will flow from the chamber 23 into the overflow compartment 13. The pulp level 20 in the chamber 23 with which the outlet 5 communicates will therefore be kept constant all the time.

The excess pulp located in the overflow compartment 13 is drawn from it by means of the outlet conduit 16 and this excess pulp will then be fed back into the inlet box 2' and recycled into the chamber 23. The float 14 located in the overflow compartment 13 below the top edge 12 of the overflow partition 10, 11 serves, in cooperation with the regulating mechanism 15 and the valve 17, to keep the pulp level in the overflow compartment always below the pulp level 20 in the chamber 23. This assures that the excess pulp is always free to flow over the top edge 12 from the chamber 23 into the overflow compartment 13 and prevents a buildup of the pulp level 20 in the compartment 23 above the top edge 12 of the overflow partition.

The air pressure within the container 1 above the pulp level 20 is regulated and kept constant by means of the pump 18 and the valve regulated air conduit 19. Depending on the air pressure desired above the pulp level 20, the pump 18 is driven either as a suction pump or compression pump. During the operation of the machine the pump 18 and the valve 19' are regulated in such a way that the air pressure above the pulp level is kept constant.

Other Patents of Interest

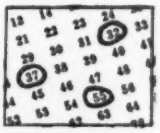
Subject	Inventor or Assignee	Patent No.	Date
Apparatus for reeling wet paper	Consolidated Electrodynamics Corp.	2,952,201	9/13/60
Shopping bag	Interstate Bag Co. Inc.	2,952,396	"
Bag made of composite material	Arkell Safety Bag Co.	2,952,397	"
Multiwall bag construction	Arkell and Smiths	2,952,399	"
Chipboard box	Richard J. McCall	2,953,292	9/20/60
Dispensing carton	Carl E. Anderson	2,953,293	"
Forming seams in multi-wall bags	St. Regis Paper Co.	2,953,976	9/27/60
Apparatus for removing broke from a paper machine	The Black-Clawson Co.	2,954,082	"
Collapsible polyhedral carton	KVP Sutherland Paper Co.	2,954,152	"
Collapsible boxes	Modern Millinery Box Corp.	2,954,153	"
Batch pulper	John W. Bolton & Sons Inc.	2,954,174	"
Water repellent paper and sheathing board	National Gypsum Co.	2,954,302	"
Self locking containers	Michael J. Herlihy	2,954,914	10/4/60
Sanitary-opening bags	Central States Paper & Bag Co.	2,954,915	"

FOR FURTHER INFORMATION ON

- New Products
- New Literature
- Advertised products and services

Use this Return Card

To obtain further information quickly—and at no obligation—on any of the above items in this issue, circle the corresponding number on the attached card. We will forward your request promptly to the manufacturer, who will send the information directly to you.



*Requests from outside the United States must be placed in envelopes, stamped and addressed to: Readers' Service Dept.

The PAPER INDUSTRY
431 South Dearborn St.
Chicago 5, Ill., U. S. A.

APRIL, 1961

NOTE: Card void after June 30, 1961

The PAPER INDUSTRY

Please have the manufacturers send me without obligation information or bulletins indicated by the numbers circled below.

Name.....Title.....
Company Name.....
(Must be included)
Company Address.....
City.....State.....
(If you prefer delivery at home, give home address, too)
Home Address.....
City.....State.....

New Products and New Literature

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41	42	43	44
45	46	47	48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63	64	65	66
67	68	69	70	71	72	73	74	75	76	77
78	79	80	81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96	97	98	99

Advertised Products and Services

101	102	103	104	105	106	107	108	109	110	111
112	113	114	115	116	117	118	119	120	121	122
123	124	125	126	127	128	129	130	131	132	133
134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155
156	157	158	159	160	161	162	163	164	165	166
167	168	169	170	171	172	173	174	175	176	177
178	179	180	181	182	183	184	185	186	187	188
189	190	191	192	193	194	195	196	197	198	199

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

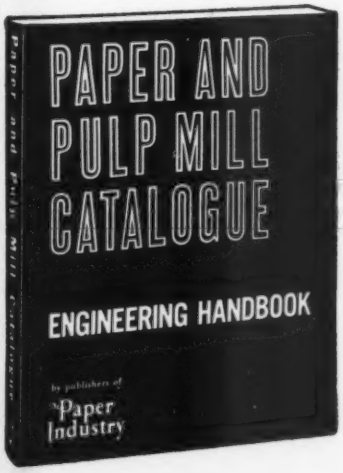
BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1704 — CHICAGO, ILLINOIS

Readers' Service Dept.

***The* PAPER INDUSTRY**

431 South Dearborn St.

Chicago 5, Ill.



37TH EDITION

ON THE DESKS OF MEN WHO SPECIFY AND BUY IN . . .

Every operating paper and pulp mill in the United States and Canada

A one-volume, composite Catalogue or permanent classified Reference File of manufacturers' catalogues, a Buyers Service Section, and the Engineering Handbook. Published annually in September.

This book provides a quick, "easy to use and order from", all-inclusive service which eliminates searching through files for individual catalogues and engineering books.

(Continued on opposite side)

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1704 — CHICAGO, ILLINOIS

Readers' Service Dept.

***The* PAPER INDUSTRY**

431 South Dearborn St.

Chicago 5, Ill.

APRIL, 1961

NOTE: Card void after June 30, 1961

The PAPER INDUSTRY

Please have the manufacturers send me without obligation information or bulletins indicated by the numbers circled below.

Name..... Title.....

Company Name..... (Must be included)

Company Address.....

City..... State.....
(If you prefer delivery at home, give home address, too)

Home Address.....

City..... State.....

New Products and New Literature

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41	42	43	44
45	46	47	48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63	64	65	66
67	68	69	70	71	72	73	74	75	76	77
78	79	80	81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96	97	98	99

Advertised Products and Services

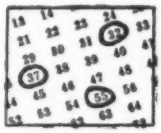
101	102	103	104	105	106	107	108	109	110	111
112	113	114	115	116	117	118	119	120	121	122
123	124	125	126	127	128	129	130	131	132	133
134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155
156	157	158	159	160	161	162	163	164	165	166
167	168	169	170	171	172	173	174	175	176	177
178	179	180	181	182	183	184	185	186	187	188
189	190	191	192	193	194	195	196	197	198	199

FOR FURTHER INFORMATION ON

- New Products
- New Literature
- Advertised products and services

Use this Return Card

To obtain further information quickly—and at no obligation—on any of the above items in this issue, circle the corresponding number on the attached card. We will forward your request promptly to the manufacturer, who will send the information directly to you.



*Requests from outside the United States must be placed in envelopes, stamped and addressed to: Readers' Service Dept.

The PAPER INDUSTRY
431 South Dearborn St.
Chicago 5, Ill., U. S. A.

OVER 500 PAGES OF INDISPENSABLE INFORMATION

CONTENTS:

- **Manufacturers Catalogue Section** — contains pages and complete inserts giving information and data on products of individual manufacturers. Pages appear in alphabetical order by names of manufacturers.
- **Buyers Service Section** — includes a comprehensive, cross-reference list of machinery, equipment, materials and chemicals with names of responsible manufacturers and suppliers; a list of trade names; complete addresses of all firms that are listed in the Section; and a directory of educational institutions in the United States and Canada having courses of instruction in the manufacture of pulp and paper.
- **Engineering Handbook Section** — a compilation of practical engineering data, formulas, graphs, charts, tables, etc., including a section dealing with uses and hazards of chemicals used in pulp and paper making. New material added yearly.

Paper and Pulp Mill Catalogue
is published by . . .

FRITZ PUBLICATIONS, INC.
431 South Dearborn Street
Chicago 5, Illinois

Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Prime coat system

This prime coat system is specifically designed to increase the adhesive properties of hot polyethylene extrusions to cellophane and foils. Called Borden's SO-242, the product is applied directly to the cellophane or foil by wash coat prior to the extrusion of polyethylene and then air dried. Coverage is rated at less than 1/10 lbs. per 3000 sq. ft. of dry ream. The product is clear and has a viscosity of approximately 16 seconds number two Zahn. **Borden Chemical Co.**

Circle No. 1 on Readers' Service Card

White polyethylene

A 45-per cent concentrate white polyethylene which can be blended with any of the company's polyethylene extrusion and film resins to suit specific end use requirements, is now available. Designated Monsanto polyethylene 6407, the concentrate is compounded with polyethylene 70 and a rutile titanium dioxide pigment which is said to reduce materially screenpack and nonuniform pigment feed. **Monsanto Chemical Co.**

Circle No. 2 on Readers' Service Card

Flow transducer

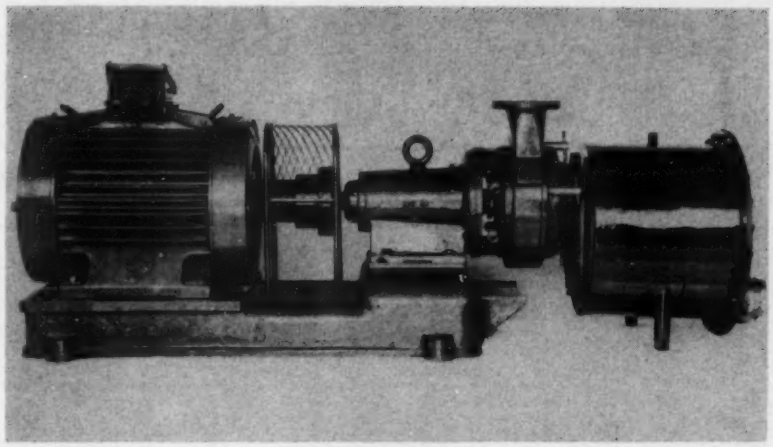
An improved version of the Mark V flow transducer for the measurement of fluid flows in large pipe lines, is now available. The new unit, in the form of a probe, features applicability to unlimited line sizes and flow rates, installation by one man, and low pressure loss. It meters any fluid that can be safely contained in stainless steel. **Ramapo Instrument Co. Inc.**

Circle No. 3 on Readers' Service Card

Base for control valves

A modular manifold base, designed for multiple manifold mounting of ½ in. PDQ control valves, is now available. Meeting JIC standards and featuring common supply exhaust and wiring conduit ports, the new bases can be ganged end-to-end to manifold two or more valves in a single assembly. Cylinder ports are side and bottom tapped, ⅜, ½, or ¾ in. NPT. Supply port is tapped both ends and bottom, 1 in. NPT, while exhaust and wiring conduit ports are tapped 1¼ in. NPT, both ends and bottom. **Hunt Valve Co.**

Circle No. 4 on Readers' Service Card



Supraton

The Seila Supraton, an ultra sonic fibre dispersion unit, affords complete dispersal of fibres in furnishes of dried pulp, waste papers, machine broke, including wet strength and de-inked stocks, without cutting or hydration. The stuff, passing through the chambers formed by the specially designed grooves on the rotor and stator, is alternately compressed and decompressed more than 10,000 times per second as the volume of each chamber is decreased and increased by the turning of the rotor. Fibre bundles are loosened and shaken apart by the near ultra sonic vibration and they are finally dispersed by the high turbulence generated within the machine. **Nichols Engineering & Research Corp.**

Circle No. 6 on Readers' Service Card

Butterfly valves

The new butterfly valves are rated at 150 lbs. water pressure and cover a pipe size range from 2 to 18 in. Valves have nickel-plated cast iron or cast steel bodies with stainless steel trim. They are particularly desirable in new installations because their compact design and light weight eliminate the need for additional line bracing. **Lunkenheimer Co.**

Circle No. 5 on Readers' Service Card

Self-loading packer

A self-loading packer to collect refuse from existing Dempster-Dumpster containers has been announced. Kits for the conversion of old containers to the new system, together with complete instructions and working drawings are now available from the manufacturer. These kits consist of new lids and container handling side channels which can be welded into place. **Dempster Bros. Inc.**

Circle No. 7 on Readers' Service Card

Paper knife

A new super hardened paper trimming knife is now available, which speeds up production. Under ordinary use, the knife can run up to 96-144 hrs. before regrinding. Dust and drag are virtually eliminated. **Ohio Knife Co.**

Circle No. 8 on Readers' Service Card

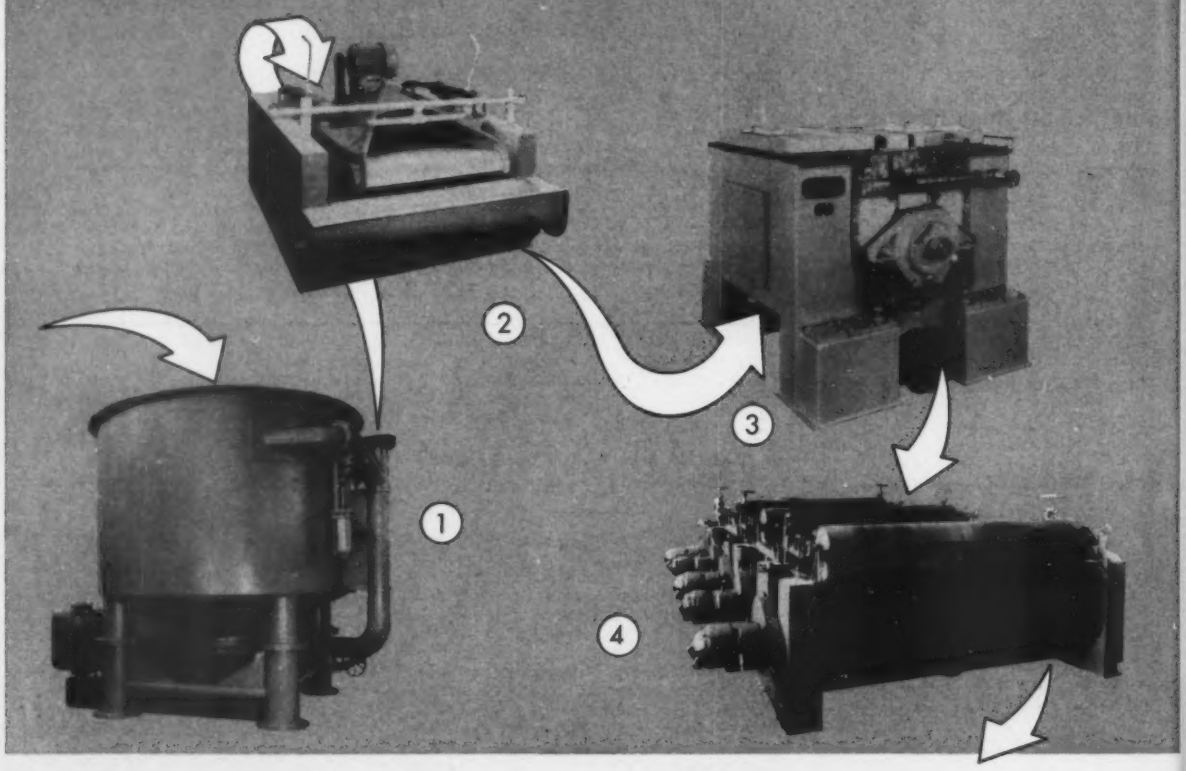
Recording feeder

This volumetric chemical feeder adapted for loss-of-weight recording, controls dry-chemical flow precisely and provides permanent records of feeder operation. Feeder design assures uniform delivery at rates between

Continued on page 59

DE-INK
EQUIPMENT

1. IMPCO SOLVO PULPER
2. IMPCO VIBROOKE SCREEN
3. IMPCO LINDBLAD SCREEN
4. IMPCO OPEN CYLINDER WASHERS



Installing a new de-ink system? Looking toward modernizing your existing system? Stripping coating from broke? Need highest quality for good printability?

The finest de-ink grades are being made down by the gentle but complete pulping action of the Solvo. The new Vibrooke Screen working in conjunction with the Lindblad Screen is the best combination of screening action available at any price. For ink, dye, coating and clay removal, Open Cylinder De-ink Washers are considered superior by experienced operators. Impco has been furnishing these dependable units for forty years! Wire cleaning on each cylinder revolution allows highest capacities.

Impco's long experience in de-inking is available to you in your remodeling or new plant planning.

IMPROVED MACHINERY, INC.
NASHUA, NEW HAMPSHIRE

IN CANADA: Sherbrooke Machineries Limited, Sherbrooke, Quebec

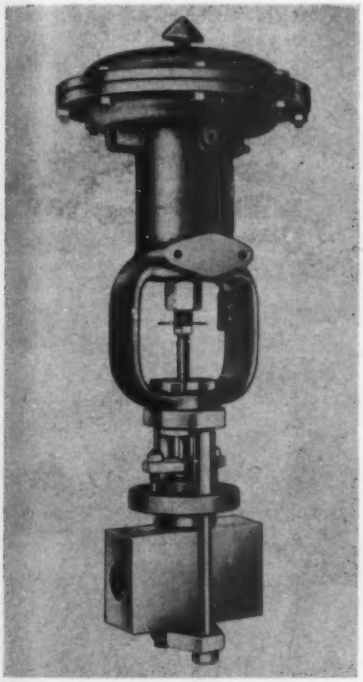
For more data circle 133 on Post Card

NEW PRODUCTS

Continued from page 57

0.0045 and 2.8 cu. ft. per hr. A screw-type feed section prevents flooding. Built-in diaphragm agitators prevent arching of material in the hopper. **Wallace & Tiernan Inc.**

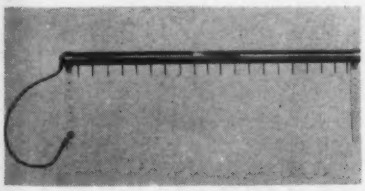
Circle No. 9 on Readers' Service Card



Plastic bar stock body

Now available is the Design BP plastic bar stock body for applications handling highly corrosive fluids. It is available only in single port globe style in 1/2, 3/4, and 1 in. sizes. Material is Penton or Type I rigid polyvinyl chloride with ratings up to 125 psi. Both bodies are available with screwed end connections. **Fisher Governor Co.**

Circle No. 10 on Readers' Service Card



Static bar

A self-induction type static neutralizer is not intended to take the place of the electrically-operated static eliminators. The bar extends across the material with the ionizing points 1/2 or 3/4 in. from the web. It is ideal for coating and spreading machines, and reduces the static on driving and conveyor belts, as well as calenders and rewinders. **Portland Co.**

Circle No. 11 on Readers' Service Card

Spray nozzles

Slope-bottom whirljet spray nozzles are now available in larger capacity 1/2 in. inlet sizes. With these larger capacity nozzles, the whirljets are now available in a large choice of capacities, ranging from .08 to 19.0 gal. per min. **Spraying Systems Co.**

Circle No. 12 on Readers' Service Card

Slurry pump

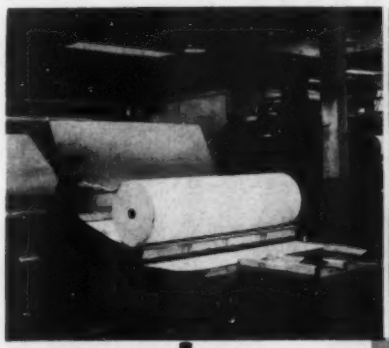
The new pump is especially designed for pumping jobs where both abrasive and corrosive substances are present. The "JC" line is available on three different bearing frames, eleven models in six sizes: 1, 1 1/2, 2, 2 1/2, 3 and 4 in. **Morris Machine Works**

Circle No. 13 on Readers' Service Card

Electronic temperature controls

The encapsulated electronic circuitry is moisture and dust-proof and is designed for general temperature con-

Continued on page 61



Transfer FINISHED ROLLS

MURCO HYDRAULIC ROLL LOWERING TABLE

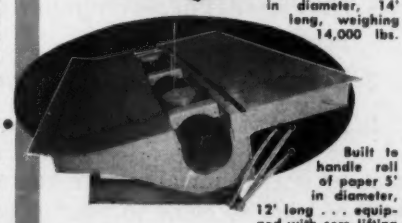
• SAFELY • QUICKLY
• ECONOMICALLY

MURCO Hydraulic Roll Lowering Tables do away with complicated, expensive recessed elevators or cumbersome overhead hoist arrangements. Transfer of the finished roll is a simple and safe operation . . . prevents paper roll damage . . . no bending or breaking winder shafts as the shaft is never used as a lifting arbor . . . compact . . . occupies small floor space . . . rigid construction positively prevents movement when table is loaded. Made in sizes practical for any normal size paper roll.

A "STAND-IN" THAT REALLY SAVES TIME!

You have a spare winder shaft always ready to put on without removing the winder shaft from the finished roll of paper . . . in this "well" that is part of the Roll Lowering Table . . . does not interfere in any way with the table's operation . . . the shaft lies flush in the "well" until taken out for use.

Built to handle roll of paper 60" in diameter, 14' long, weighing 14,000 lbs.



Built to handle roll of paper 5' in diameter, 12' long . . . equipped with core lifting device in the "well".

Write today for quotation on size to meet your plant operation . . . state height from floor to winder; length of paper roll; diameter of paper roll; weight of paper roll.

MURCO

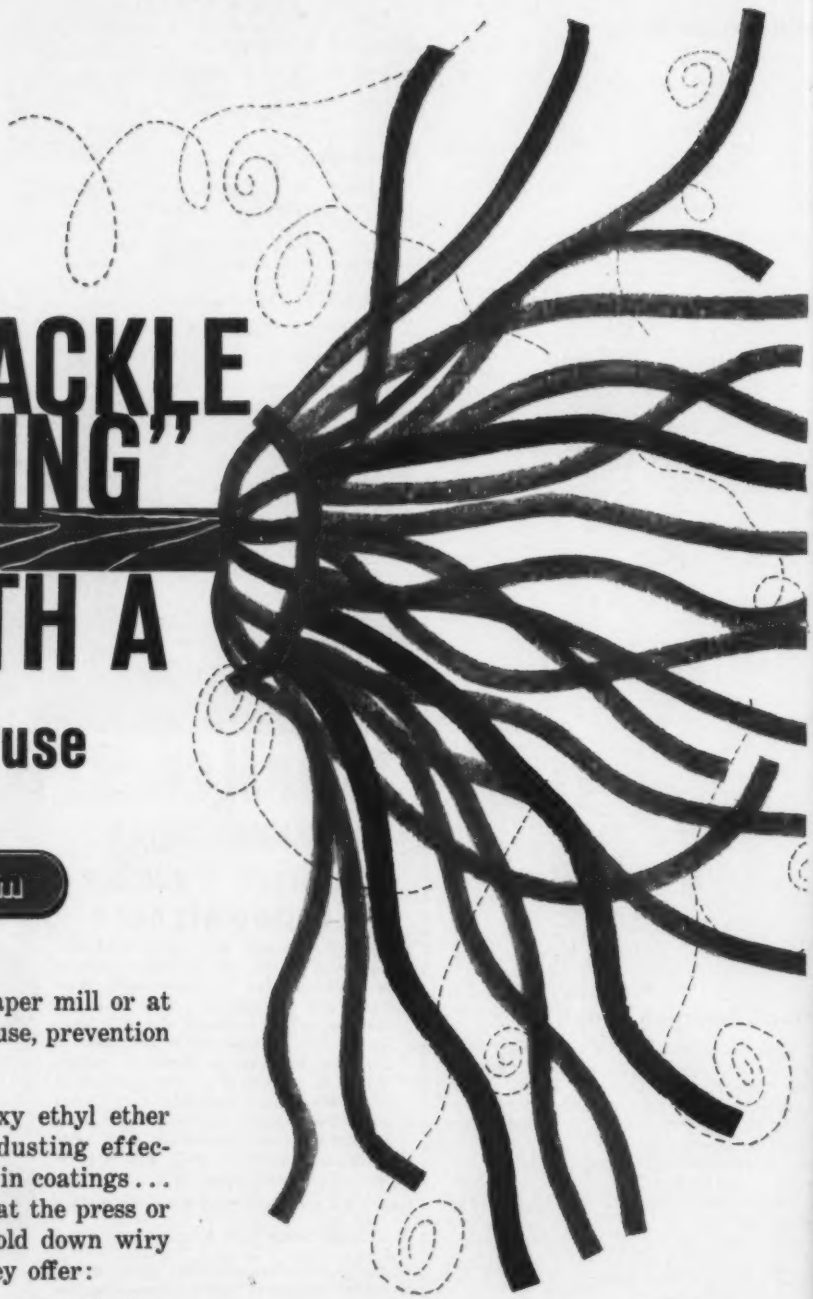
D. J. MURRAY MANUFACTURING CO.

MANUFACTURERS SINCE 1883 • WAUSAU, WISCONSIN

For more data circle 134 on Post Card

DON'T TACKLE "DUSTING" WITH A MOP use

Penford Gum



Dusting can happen at the paper mill or at the printer's. Whatever the cause, prevention is the only "cure."

The Penford Gums (hydroxy ethyl ether starch derivatives) combat dusting effectively when used as adhesives in coatings . . . as pure surface sizes applied at the press or on the calenders . . . and to hold down wiry fibers on uncoated sheets. They offer:

1. *Exceptional adhesive pigment-binding properties*
2. *Tough, flexible filming characteristics*
3. *Improved water-holding ability*

One of our technical service representatives will be glad to come to your plant to show you how Penford Gum can help you improve your paper on *all* counts without increasing costs. Call or write Penick & Ford today.

PENICK & FORD, LTD.
INCORPORATED
750 THIRD AVENUE, NEW YORK 17, N. Y.
1531 MARIETTA BLVD., ATLANTA, GA.
CEDAR RAPIDS, IOWA
333 MARKET ST., SAN FRANCISCO 5, CALIF.

For more data circle 135 on Post Card

Knox Felts
KNOX WOOLEN COMPANY
CAMDEN, MAINE
America's First Manufacturer of Endless Paper Machine Felts

For more data circle 136 on Post Card

NEW PRODUCTS

Continued from page 59

trol uses in ranges from −300° F. to +2000° F. The unit is unaffected by normal line voltage fluctuations. **Electronic Processes Corp.**

Circle No. 14 on Readers' Service Card

Sight flow indicator

This sight flow indicator allows an inside view of the pipeline to determine if there is flow and the direction and condition of the fluid. It uses machined recesses and retaining rings for even seating of the sight glass gaskets to prevent leakage. **Schutte & Koerting Co.**

Circle No. 15 on Readers' Service Card

Alarm gauge

A new device for paper or plastic film inspection has been introduced which signals audibly or visually when the width of a moving web falls outside preset tolerances. It is easily installed on calenders, inspection perches, dryers or extruders. **Matrix Controls Co. Inc.**

Circle No. 16 on Readers' Service Card

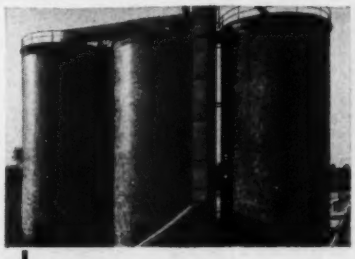
Material level control

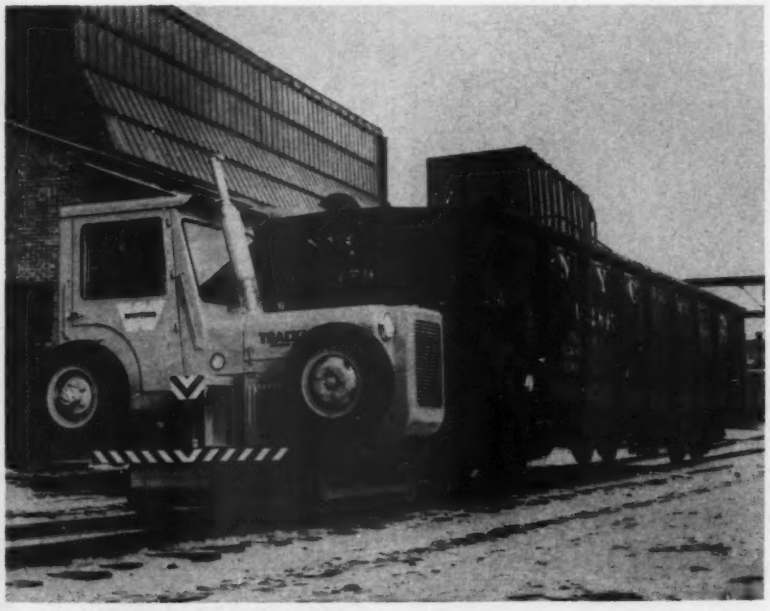
A fully self-contained capacitance probe-type material level control for direct mounting on bins, hoppers, tanks or other containers holding dry, semi-dry or liquid materials, is now available. Presence or absence of material is detected by the probe through changes occurring in the electrostatic field. **Flo-Tronics Inc.**

Circle No. 18 on Readers' Service Card

Expansion joint used as gutter

A neoprene expansion joint with metal edges is being put to a new use as a gutter, to prevent water dripping





Diesel engine trackmobile

Trackmobile, a utility rail and road vehicle, has recently been made available with a diesel engine. A four cylinder, four cycle valve-in-head engine rated at 105 hp at 2500 RPM, it can pull heavily loaded rail cars into a blind stop, and can roll across the tracks to the next job. **Whiting Corp.**

Circle No. 17 on Readers' Service Card

We Design, Erect and Maintain All Types of

Tile Structures and Corrosion — Resistant Linings

STEBBINS ENGINEERING AND MANUFACTURING CO.

WATERTOWN, N. Y.

Pensacola, Seattle
Montreal, Vancouver

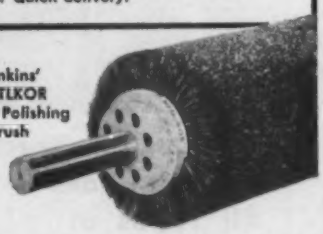
For more data circle 137 on Post Card

PRIVATE EYES

Jenkins' METLKOR brushes, teamed with Viking's Void Detector, check every inch of paper as it is made, find holes, measure them, count them, record them, pinpoint their positions and signal the operator, all automatically. The Jenkins' feeler brush, a critical part of the system, sends a low voltage pulse to the Viking Indicator Unit whenever a hole appears.

John Glump, Vice-President of Viking Instruments, Inc., of East Haddam, Conn., says: "Jenkins' brushes do a superb job for us. They are an improvement on 13 counts:

1. Improve accuracy of flaw detection.
2. Have no abrasive effect on product.
3. Eliminate lint problem.
4. Outlast previous brushes 3 to 1.
5. Made exactly to size, no cutting or alterations necessary.
6. Simplified mounting.
7. Improved construction.
8. Superior bristles.
9. Refillable when bristle is worn.
10. More economical.
11. Free engineering service.
12. Speedy solution to problem.
13. Quick delivery."



Jenkins' METLKOR Paper Polishing Brush

Jenkins' also makes the following brushes for the paper industry:

Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Static Elimination • Flocking • Felt Cleaning • Feed or Carrier • Paint Brushes • Floor Sweeps

Specify Jenkins' METLKOR
the original . . . the best *Metal Core* brush

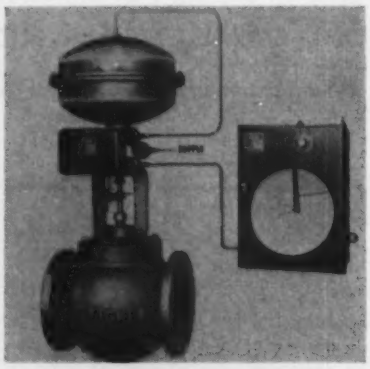
METLKOR®
CYLINDER BRUSHES
and LIFEWOOD® WOOD BACKED BRUSHES

M. W. JENKINS' SONS, INC.
— Serving Industry for 80 Years —
442 Pompton Ave., Cedar Grove
Essex County, N. J. • CEnter 9-5150

For more data circle 138 on Post Card

through cracks in concrete ceilings. Cement nails, or ramset hold the metal edging, and all water is conducted in the gutter to the outside of the building, or to a downspout. **Lamont & Riley Co.**

Circle No. 19 on Readers' Service Card



Recording type controller

A recording type pressure and temperature controller for industrial processes is now available. The instrument maintains any desired pressure or temperature by regulating the flow of steam or liquid through a diaphragm motor valve. Operating the controller is an air measuring system actuated by a process tempertaure or pressure measuring system. To prevent cycling, the instrument has a 1 to 10 per cent proportional band adjustment with manual reset. **Stickle Steam Specialties Co.**

Circle No. 20 on Readers' Service Card

New rotor

A new Hydrapulper rotor which doubles defibering efficiency, provides optimum performance for split rolls, slab, sheet-trim broke, bale and bulk furnishes, wet strength, as well as in blending mixing. A full consistency range provides for batch or continuous operation. Extraction and dump openings are non-plugging. The Vokes Rotor operates at close tolerance with the bedplate, or attrition ring, which is adjustable to obtain optimum performance. **Black-Clawson Co., Shartle Div.**

Circle No. 21 on Readers' Service Card

Airjet sonic defoamer

The new compressed-air operated sonic defoamer is constructed of stainless steel without moving parts. It uses an air jet to generate extremely high intensity sound waves that shatter bubbles and disintegrate foam. Defoaming is made possible in those solutions in which conventional chemical defoaming agents cannot be used because of contamination. **Teknika Inc.**

Circle No. 22 on Readers' Service Card

Safety device for elevators

A safety stop device for employee manlift elevators prevents a rider from going over the top if he neglects to get off at the top landing, or if other stop devices fail to function properly. Designated the SAH-12 safety stop device, it consists of a lightly supported tubular steel bar and an electrical limit switch. **Humphrey Elevator Co.**

Circle No. 23 on Readers' Service Card

Paper sorter

An electronic paper sorter scrutinizes the entire surface of a running web feeding into a sheet cutter, detects flaws and imperfections and diverts imperfect sheets into a reject pile after they have passed through the cutter. All electronic components are of the plug-in, quick-change type and most tubes are of the long-life type to reduce the possibility of tube failure. The equipment can be furnished to operate at speeds up to 1000 ft. per min., and can be applied to any make of sheet cutter. **Kohler Coating Machinery Corp.**

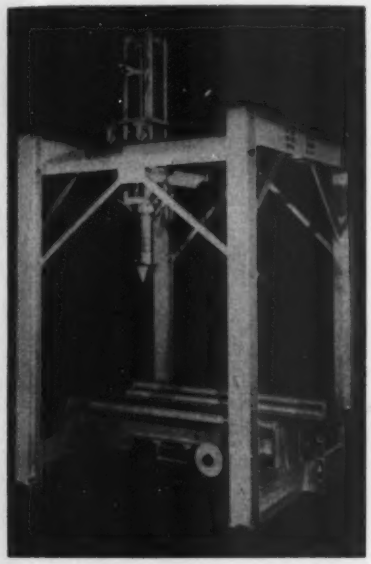
Circle No. 24 on Readers' Service Card

Curtain coating machine

A new curtain coating machine has been developed for use by paper and board converting operators. This coater incorporates the flow-coating principle of passing the work piece to be coated through a continuous, falling curtain of coating material. The thickness of the material deposited on the work piece is

regulated by the flow rate and the speed of travel through the machine. Applied coating thicknesses may vary from ½ mil wet to 25 mils or more. **Gasway Corp.**

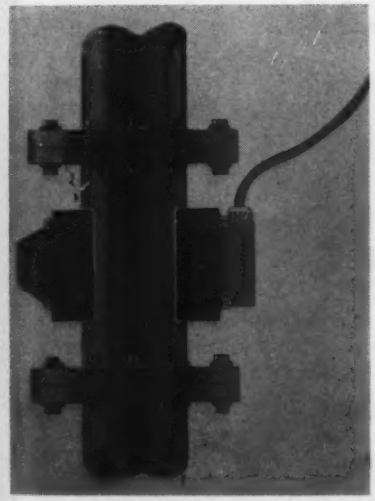
Circle No. 25 on Readers' Service Card



Roll breaker

An hydraulic roll breaker has been introduced which reduces the task to a one-man power-assisted operation. The hydraulically-operated overhead wedge is supported on a frame that straddles the roll conveyor. Defective rolls are stopped as they come through the conveyor. The wedge is quickly aligned over the slit, then driven down to separate the rolls. **Lamb-Grays Harbor Co. Inc.**

Circle No. 26 on Readers' Service Card



Sludge reader

This sludge reader eliminates problems associated with maintaining proper sludge or slurry flow consistencies passing through pipe lines. Utilizing harmless nuclear energy, the sludge reader will react to changes in solids, concentrations passing through the line, and stop or start the sludge pump. Variations in the sludge density in the pipe line will cause variations in the nuclear beam as received by the detector. **Komline-Sanderson Engineering Corp.**

Circle No. 27 on Readers' Service Card

Drum cooler and heater

The Panelcoil drum warmer is equipped to heat or cool a 55-gal drum with pressures to 125 psi. Two semi-cylindrical sections of Panelcoil are permanently mounted on a steel structure leaving the middle section free, should the fluid contents of the drum need to be removed from the side. Rigid or flexible piping may be permanent or easily disconnected if the equipment is to be moved about the plant. **Dean Products Inc.**

Circle No. 28 on Readers' Service Card

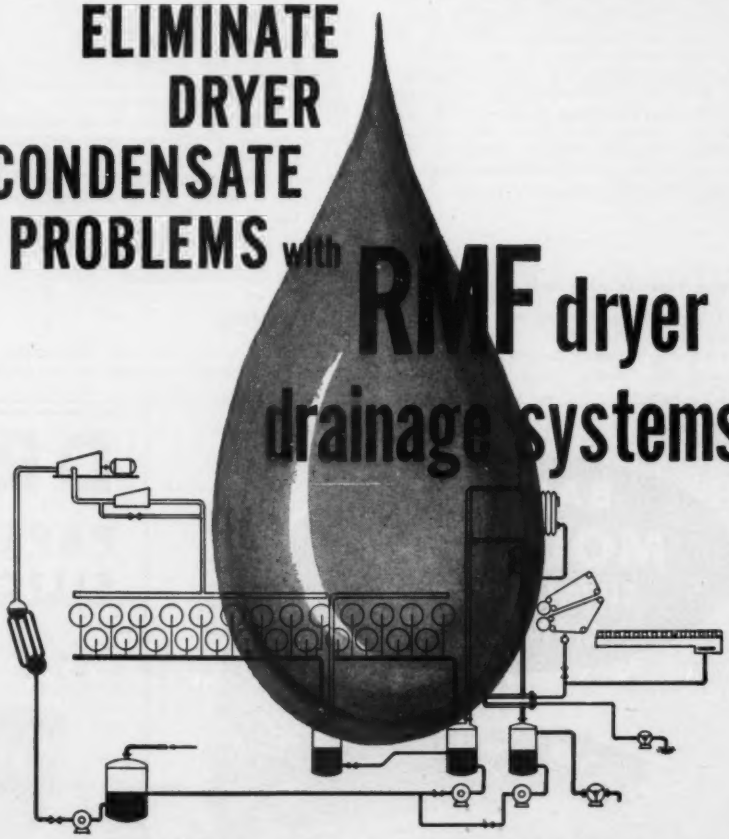
Ball valve

This ball valve features compact one-piece forging, and built-in union ends which simplify installation, operation and maintenance. The Petro ball valve is designed to control flow of liquid or gas. Available in stainless steel, carbon steel or brass, it comes in eight sizes, ¼ to 2 in. **Clayton Mark & Co.**

Circle No. 29 on Readers' Service Card

Continued on page 64

ELIMINATE DRYER CONDENSATE PROBLEMS with RMF dryer drainage systems



- *Increase Dryer Capacity*
- *More Uniform Drying*
- *Higher Production*
- *Prevent Reject Sheet*

Our Dryer Drainage Systems will effectively eliminate your water condensate problems. Drying capacity is substantially increased and you get more effective drying at lower temperatures. In addition, RMF Systems result in more uniform drying across the sheet, assuring automatically graduated dryer temperatures. This lessens shrinkage, cracking, curling, wet streaks and hardening.

Send for Bulletin.

ROSS MIDWEST FULTON
A Division of Midland-Ross Corporation
Box 846, Dayton, Ohio

For more data circle 139 on Post Card

NEW PRODUCTS

Continued from page 63

Densitometer

A new portable, pneumatically-actuated densitometer that continuously indicates the determination of specific gravity of flowing fluids, such as coatings, additives and others, is now available. It can be installed in conjunction with any flowline where specific gravity indication is desired. **Bell Corp.**

Circle No. 30 on Readers' Service Card

Vibrating screens

Styled the "Rumba", these vibrating screens feature custom building to fit specific needs; correct size vibratory unit; long screen life with elimination of whipping and flexing; and engineered application of feed and discharge system. A rubber mounted assembly provides ample vibration and longer screen life. **Hutchison Mfg. Co.**

Circle No. 31 on Readers' Service Card

New fourdrinier wire

A new fourdrinier wire is flatter and smoother than other wires and is woven by a new method which fabricates the "warp" and "shute" wires on the same level plane. It provides greater stock and filler retention, more rapid drainage and eliminates the two-sidedness of the paper sheet. **Wisconsin Wire Works**

Circle No. 32 on Readers' Service Card

Cleaning powder

A white, non-dusting cleaning powder is especially effective in cleaning or purging of wet end systems in paper mills. It is also useful in cleaning coating vats, storage tanks and coating rollers. The product dissolves instantly in plain water and leaves no residue. **Harry Miller Corp.**

Circle No. 33 on Readers' Service Card

Dialdehyde starch

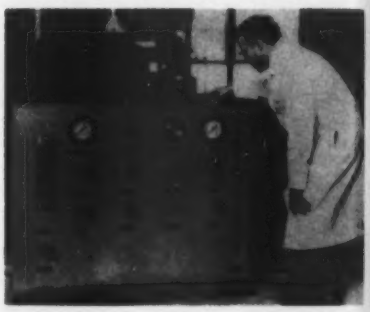
A new dialdehyde starch product imparts greatly improved strength to paper. The starch, called Sumstar 190, improves wet tensile strengths up to 700 per cent and dry tensile strengths up to 45 per cent over untreated paper. By combining it with alum or cationic starch, the dialdehyde starch could be used as a beater additive. **Miles Chemical Co.**

Circle No. 34 on Readers' Service Card

Roll splitter

A mechanical device for splitting pulp or reject paper rolls is now available. It eliminates dust conditions, there is no litter, and the split pulp or paper rolls are either delivered directly to the repulper or the pallets carrying the split rolls. **Sandy Hill Iron & Brass Works**

Circle No. 35 on Readers' Service Card



Starch cooker

This continuous starch cooker is designed to facilitate preparation of size press coating and calender solutions as well as machine coating operations and wet end additions. The design principles incorporated in the cooker are simple and the parts required are few. Gages and controls are mounted on the control panel for easy accessibility. **Penick & Ford Ltd. Inc.**

Circle No. 36 on Readers' Service Card

BARRETT
MODEL J-R
SINGLE-STROKE
LIFT-TRUCK

BARRETT Model J-R is the lowest priced work horse of ALL lift-trucks. Built for rough, hard handling jobs 2500- to 4000-lb. capacity loads from 30" to 72" long. Lift 1⅝" to 2⅜" standard. ONE STROKE raises skid—step on release treadle and hydraulic check lowers load gently.

Barrett Model J-R fits any type skid—just run truck under skid. One handle stroke lifts.

WRITE FOR LOW PRICES AND BULLETIN 555-1

BARRETT-CRAVENS COMPANY
658 Dundee Road, Northbrook, Illinois
Representatives in All Principal Cities

BARRETT
ONE MAN DOES MORE THAN 3 OR 4...WITH A BARRETT

For more data circle 140 on Post Card

DRYING...
PAPERS • COATINGS
SILICONE • LATEX
CLAY

It will pay you to investigate the efficiency and economy of the new RED-RAY Type "H" Burner, latest development of RED-RAY infra red drying experience.

Write for further information to:

RED-RAY MFG. CO., INC.
318 CLIFF LANE • CLIFFSIDE PARK, N. J.
Tel.: WHitney 3-1000

For more data circle 141 on Post Card

Books

PULP AND PAPER Chemistry and Chemical Technology, Vol. 1 Second Edition, by James P. Casey. Published by Interscience Publishers Inc., 250 Fifth Ave., New York, N.Y. Price: $19.50 (3 vol.)

The first volume, Pulping and Bleaching, has been written for advanced students and chemists already working in the paper industry, yet contains fundamental knowledge on the chemistry of paper. Written with the idea that this middle ground is a fertile field for the growth of new ideas, the author concentrates on the new concepts of cellulose and lignin while also emphasizing colloid chemical processes. This is essentially a text and reference book.

POLYSTYRENE, by Willam Teach and George Kiessling, Koopers Co. Inc. Published by Reinhold Publishing Corp., New York. 171 pp. Price: $5.00.

This book provides a simplified and technical introduction to the chemistry, properties, manufacture and uses of polystrene. One entire chapter is devoted to the manufacture, fabricating techniques and various uses of expandable polystyrene.

Primarly directed to molders, fabricators and end-users of polystyrene, this book presents a working guide to every major known procedure for producing this plastic.

USDA Reports

AVAILABLE from the U. S. Dept. of Agriculture — Forest Service, Southeastern Forest Experiment Station, Asheville, N.C., is Station Paper No. 109, Losses from Defect in Piedmont Hardwoods, by W. C. Bryan. Concerned with a woods survey and a mill study, the publication includes: defects and their correlation with other factors; the influence of face direction and slope aspect on face grade; the influence of site upon tree vigor; and the detection of external indicators of defect.

RECENTLY PUBLISHED by the U. S. Forest Products Laboratory, Madison, Wis., are a series of technical reports on foreign woods: No. 2167, Mahogany, describes the physical and mechanical properties of Central and South American mahogany; No. 2172, Determining Preservative Retention in Piling by the Assay of Borings, describes a method of checking the amount of preservative retained in various kinds of wood piling to evaluate the quality of treatment; No. 2175, Groundwood Pulping of White Fir and Corkbark Fir, gives the results of groundwood pulping experiments and a summary of the use of these pulps in papermaking.

WORLD FOREST INVENTORY 1958. Published by the Food and Agriculture Organization of the United Nations. 137 pp. $2.50.

This present inventory, prepared in collaboration with the Economic Commission for Europe, is the third in the quinquennial series. Complete with diagrams, figures, and charts, it analyzes accessible forests, forests in use, growing stock and the annual harvest of wood.

WOOD PULP STATISTICS—25TH EDITION. Published by the United States Pulp Producers Assoc. Inc., 122 E. 42nd St., New York, N.Y. 263 pp. $10.

This is an annual publication which presents the historical record of wood pulp supply and requirements in the major producing and consuming countries of the world. Compiled from official sources, it brings together for ready reference, information basic to the understanding of world pulp and paper markets.

Manufacturers' Publications

Copies of these publications are available at no obligation through our Readers' Service Department. Use the reply card which accompanies this issue when requesting items.

Water service bulletin

Layne & Bowler Inc. is offering a bulletin giving general facts and information on water well systems, water pumps, well drilling and allied water service and equipment. The four-page, three-color bulletin also lists other bulletins available for further information.

Circle No. 37 on Readers' Service Card

New pump

Wallace & Tiernan Inc. has published a bulletin on the new model pump just added to their line of plunger pumps. The Series 100 pump is illustrated with cut-away drawings and sketches explaining the design and construction. Standard materials of contruction are also listed.

Circle No. 38 on Readers' Service Card

High vacuum components

NRC Equipment Corp. has published a condensed catalog of high vacuum components and equipment. The 8-page publication summarizes the complete line of high vacuum mechanical and diffusion pumps, valves, gauges, accessories, portable pumping systems, coaters, furnaces, electron beam welders, altitude chambers and freeze drying equipment.

Circle No. 39 on Readers' Service Card

Sizing charts

OPW-Jordan Corp. is issuing a 4-page sizing chart bulletin to show how to size OPW-Jordan's sliding gate regulators and control valves. Simplified charts cover steam, liquid and gas service and cross-reference method of compiling makes sizing easier by eliminating the need for rulers, formulas or slide rules. Technical data tells how to adjust sizing for variations in pressure, temperature, viscosity or specific gravity.

Circle No. 40 on Readers' Service Card

Sludge collectors

Link-Belt Co. has published a 28-page booklet describing the company's complete line of sludge collectors for rectangular settling tanks. New data in this publication enables selection of the proper size tank for both the type "H" and type "L" sludge collectors. New mechanical details and arrangement drawings of various designs for both collectors are illustrated and described.

Circle No. 41 on Readers' Service Card

Centrifugal pumps

Goulds Pumps Inc. has published a bulletin describing new sizes of pumps which have been added to their line. Complete specifications, interchangeability chart, performance curves and dimensions are shown.

Circle No. 42 on Readers' Service Card

Drainline

Corning Glass Works is offering a revised catalog on the Pyrex drainline. The illustrated brochure contains product and property data and lists advantages of the corrosion-resistant glass system for disposal of chemical wastes. The catalog contains full details on available fittings. Photographs, schematic drawings and charts are included along with a sample specification sheet.

Circle No. 43 on Readers' Service Card

Powdered acid cleaner

Hagan Chemicals & Controls Inc. is offering a bulletin on powdered acid cleaner for use in cleaning scale deposits from boilers, heat exchangers, water lines, pumps and other equipment. The bulletin lists directions for use, methods of use, handling, special applications, and packaging.

Circle No. 44 on Readers' Service Card

Power centers

General Electric Co. has published a 12-page bulletin describing Cabinetrol centers. The bulletin illustrates how this industrial power center is designed to centralize such functions as motor starting and control, power switching circuit relaying and sequencing, motoring, process instrumentation and control of lighting.

Circle No. 45 on Readers' Service Card

Corrosion-resistant valves

Alloy Steel Products Co. is issuing a 16-page bulletin that describes and illustrates the Aloyco line of corrosion-resistant valves. In addition to cross-section illustrations of all valves and adaptable features, with specifications for each, the bulletin summarizes the types of alloys in which each valve is available. Complete engineering specifica-

Here's How You Can Train Your Supervisors in...

COMMUNICATION FOR SAFETY

A realistic to-the-point series of 4 films teaches foremen how . . . by showing them how.

Again . . . from the National Safety Council . . . comes another supervisor training series: the all-new COMMUNICATION FOR SAFETY. Here are four films, produced by the same National Safety Council team that has won applause from safety-minded companies across the nation, with: "Safety and the Foreman"; "Supervising For Safety"; "Safety Management For Foremen"; "Speaking of Safety"; and "Human Factors in Safety". Remember — your company's safety program must be carried to your employees mainly by your supervisory personnel. It's up to them to learn the art of communication — not only for safety but to help make their work as supervisors more effective. THE COMMUNICATION FOR SAFETY film series is one way — an economical way—to TEACH THEM HOW BY SHOWING THEM HOW.

Send for further information today!

NATIONAL SAFETY COUNCIL
425 N. Michigan Ave.
Chicago 11, Illinois

Send for free brochure on NSC film series "Communication for Safety"

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

For more data circle 142 on Post Card

tions of valves and a listing of alloy materials, with chemical composition ranges and minimum mechanical properties are also given.

Circle No. 46 on Readers' Service Card

Fungicidal and bactericidal agents

Antara Chemicals, a Division of General Aniline & Film Corp., is offering a 16-page brochure which describes the characteristics of these non-volatile, chemically stable, non-irritating agents. Information given includes typical data on the compounds, including solubility, shipping specifications, preparation and properties of alkaline solutions, summary of uses, microbiocidal activity, toxicity data, method of analysis and a bibliography.

Circle No. 47 on Readers' Service Card

Pulp refiner

Sprout Waldron Co. Inc. is making available a bulletin describing the 42 in. double disc refiner for the pulp and paper industry. Complete construction details and dimensional information are given.

Circle No. 48 on Readers' Service Card

Flow metering applications

B-I-F Industries has just released a bulletin itemizing ten of its Differential Producers, covering a wide range of applications. The 8-page, two-color bulletin details, with illustrations for each, the products suitable for the metering of water, air or gas, as well as acids, alkalies and sewage. High pressure and temperature services are included.

Circle No. 49 on Readers' Service Card

Adhesives catalog

Minnesota Mining & Mfg. Co. is offering a 54-page catalog listing official United States Government specifications for a wide variety of adhesives, coatings and sealers. The catalog lists, in numerical form, military specifications, specification definitions, intended application and corresponding 3M adhesive, coating or sealer that meets these specifications.

Circle No. 50 on Readers' Service Card

Liquid meter

Neptune Meter Co. has issued a four-page bulletin on their 1½ in. stainless steel liquid meter. The circular is complete with meter specifications, and fully describes its advantages. Also included is a description and illustration of a wide choice of registers.

Circle No. 51 on Readers' Service Card

Pulp screen

Koehring-Waterous Ltd. is issuing a bulletin on "Vertifoil," a pulp screen. The 4-page bulletin describes what it is, how it works, and why it will last.

Circle No. 52 on Readers' Service Card

Potentiometer

Fischer & Porter Co. is offering a bulletin on null balance D-C Potentiometers. Full particulars on the construction, mounting, and performance of these units are given along with dimensional drawings and other operational data.

Circle No. 53 on Readers' Service Card

Speed drives

Westinghouse Electric Corp. has published an 8-page booklet on RectiFlow and Magna-Flow adjustable speed drives for pumping applications. The application data booklet presents an informative drive selector guide for the pulp and paper industry. It is illustrated with application diagrams, efficiency curves and mechanical features.

Circle No. 54 on Readers' Service Card

Temperature controls

Fenwal Inc. has issued an 8-page brochure describing its new "500" line temperature controllers and indicators. The brochure gives complete details of three models in the line and brief description of other instruments offering thermistor sensing. Contents include complete electrical and mechanical specifications, available modifications, and illustrated descriptions of various major features of the units.

Circle No. 55 on Readers' Service Card

Seal-less pumps

Chempump Division of Fostoria Corp. is issuing a bulletin on seal-less pumps. The bulletin gives design features and model specifications of models C and CW "canned pumps".

Circle No. 56 on Readers' Service Card

Fire pumps

Layne & Bowler Inc. has issued a bulletin on fire pumps. Illustrated in five colors, this six-page bulletin shows cross section drawings, typical installations, size and capacity charts and detailed advantages of the pump. Both oil and water lubricated types are shown with complete accessories.

Circle No. 57 on Readers' Service Card

Safety pamphlet

Manufacturing Chemists' Assoc. Inc. has published a pamphlet on Recommended Safe Practices and Procedures—Storage and Handling of Shock and Impact Sensitive Materials. Safety precautions include: use of spark-resistant tools, direction of all operations by qualified personnel, prevention of accumulation of sensitive waste material and isolation of processing area and segregation of individual operations.

Circle No. 58 on Readers' Service Card

Professional and Business Services

Engineering for the PULP and PAPER INDUSTRY

CHAS. T. MAIN, INC.
CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS • CHARLOTTE, NORTH CAROLINA

Technical
SALES — SERVICE
RESIDE NEW ENGLAND.
Work from home representing manufacturer paper coating and filler pigment. Experience paper and coating desired. Also willingness to travel other areas as required. Send resume, photograph and salary required which will be treated in strict confidence. Box 709, The Paper Industry.

CLASSIFIED ADVERTISING

ANY SPARE TIME?

Make your paper mill knowledge add to your income. No selling. Confidential. Write Box 710, The Paper Industry.

ADHESIVES in the PAPER INDUSTRY

Compiled and edited by A. W. J. Dyck, Ph.D.
Price $2.00 prepaid with order
Published by FRITZ PUBLICATIONS, INC.
431 S. Dearborn Street, Chicago 5, Illinois

Ten Publications for Papermakers

Pulp and Paper (Casey)	
Vol. I, Pulping and Bleaching	$19.50
Vol. II, Papermaking	25.00
Vol. III, Paper Testing and Converting	29.50
Paper and Paperboard Making (Williamson)	6.00
Adhesives in the Paper Industry	2.00
Lessons in Papermaking—Part 1 (Williamson)	1.50
Lessons in Papermaking—Part 2 (Williamson)	1.50
Notes and Observations on Beaters	1.00
Trouble on the Paper Machine	.75
Lubricants and Lubrication Equipment in the Pulp and Paper Industry	.50

Mail your order with payment to:

The PAPER INDUSTRY

431 S. Dearborn Street, Chicago 5, Illinois

You Can Be Sure!

with the
PHOTOVOLT
Photoelectric
REFLECTION METER

for accurate measurement of

Brightness and Opacity

of pulp and paper in terms of TAPPI specifications.

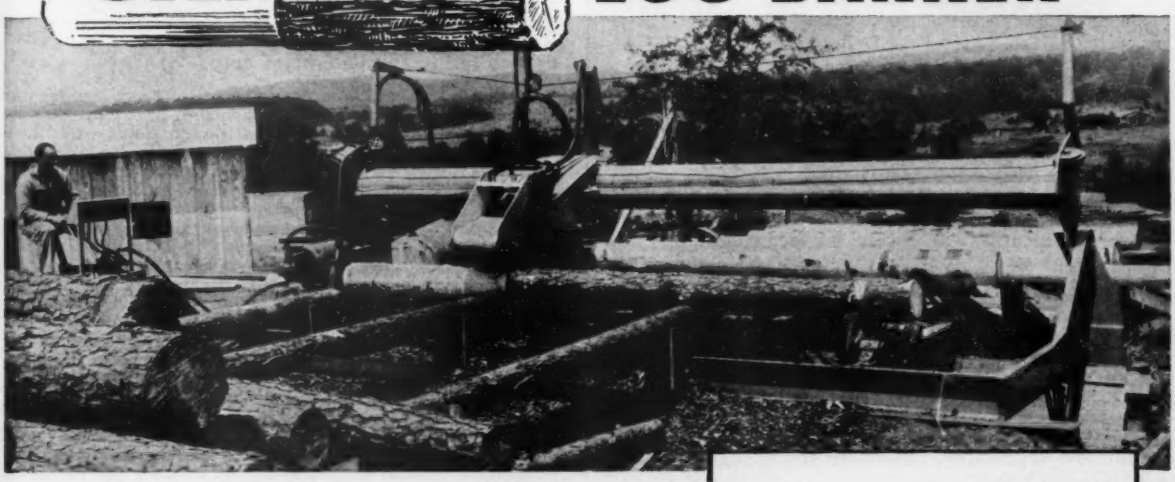
Also for ***Gloss and Color***

tests on paper, card board, and other paper products.
Portable, reliable, rugged, simple to operate
Also: Colorimeters, pH Meters

PHOTOVOLT CORP.
1115 BROADWAY NEW YORK 10, N. Y.

For more data circle 143 on Post Card

CAMPCO LOG BARKER



Exclusive Fluid Drive — for Hard or Soft Wood

Quick, thorough bark removal, with all operations controlled from central station at either end of machine. One prime mover—electric motor or gas or diesel engine—provides all power requirements. Logs turned by bull wheels with special Mapco Taper Wedge Locks which permit quick, easy relocation for logs of various lengths.

Standard models are for logs 5"—36" diameter and lengths of 20', 24' and 26'. Special models available for West Coast hardwood and veneer logs up to 55" diameter and 30' lengths.

Write for complete information

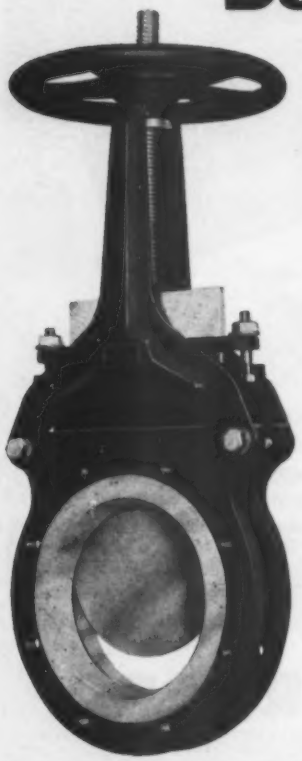
In South, address Machine Products Co., Gadsden, Ala.

CARTHAGE MACHINE CO.
CARTHAGE, N. Y.

For more data circle 144 on Post Card

NEW and Better!

DeZURIK



KNIFE GATE VALVES

NEW

Seat and gate are now machined by a method exclusively De-Zurik's to insure perfect alignment and tighter shut off. This "self-aligning" eliminates alignment problems when repacking the valve.

and Better!

The redesigned superstructure presents a neater, more streamlined appearance, yet retains the strength of previous DeZurik Valves.

Get more details in Bulletin 301.

DeZURIK CORPORATION
SARTELL, MINNESOTA

For more data circle 145 on Post Card

FOREIGN ABSTRACTS

continued from page 54

which has the weight of about 58 lbs. per cubic ft. On kraft cooking this wood gave yields of about 39 to 40 per cent. These pulps showed only moderate burst, tensile strength and folding endurance, although the internal tear resistance was fairly high.

In seeking to improve pulp quality, the following physical techniques were tried: the application of high pressures to thin pulp layers, "squeeze rolling", and freeze drying. However all of these reduced the strength of the pulp. Variations in beating were then attempted, and five different laboratory beaters were used. Here the most promising results were obtained with a Norwegian PFI beater; and the next best improvement was found by use of a Lampen mill. Both of these showed a marked improvement in pulp quality and the PFI beater gave rise to pulps having nearly acceptable burst, tensile and folding endurance without sacrifice of the internal tear resistance. However a serious disadvantage both in the PFI and the Lampen equipment was that extensive beating gave rise to excessive fiber degradation and formation of fines, which resulted in slow drainage. The author felt that possibly an inexpensive swelling agent might prove useful, but the introduction of dilute sodium hydroxide prior to sheet formation was unsatisfactory. The following beater additives were also used: glycerol, starch, gelatine, gum arabic and sodium silicate. None of these actually improved effects of beating, and only starch and gelatine gave some evidence of improving the burst factor, breaking length, tear and folding endurance of the pulp sheets. However, it was felt that the strength properties failed to reach the ones acceptable to paper manufacturers. Starch proved most effective when added after beating. The author gives some data on the sulfate pulp from the summerwood of Pinus taeda and of the dense Rhizophora apiculata. The former showed some improvement in folding endurance when treated with aqueous alkali; the latter did not.

W. E. Cohen **APPITA** 14, No 3, 108-24; discussion 124-6 (1960).

A modification of the Kappa number as applied to semichemical pulps

The Kappa no. which is now a standard procedure for determining the permanganate consumption of a pulp, can be applied only when this pulp is obtained in yields lower than 70 per cent. Above this yield, no linear relationship exists between the Kappa no. and the lignin content. This the authors believe may be due to differences in the distribution of lignin within the cell walls of pulps that are high in this component. The Kappa no. has now been modified so that semichemical pulps containing appreciable amounts of lignin can be analyzed successfully. The pulp is subjected to two successive preoxidations with permanganate, in which all of the reagent is consumed, and then to a final oxidation in which only about 50 per cent of the permanganate is used up. The sample is disintegrated rather gently, and the amount for analysis is so chosen that the final treatment consumes only ½ of the permanganate added. The treatments are given in the presence of 4**N** sulfuric and using 0.1**N** permanganate. In the two preliminary treatments, as soon as the color has been discharged, the sample is filtered, washed briefly and then flushed back into the reaction beaker and given the subsequent treatment. Reactions are carried out at 25°C., and in the final treatment, which is made in 800 ml. water with 100 ml. permanganate and 100 ml. of the acid, the reaction period is timed, so that exactly 10 minutes are used in the final oxidation. Thereupon 20 ml. of normal potassium iodide are added, and the iodine freed in this reaction is titrated with 0.1**N** thiosulfate. An equation is given for computing the modified Kappa number, which is now termed the "K_1 number" and blank determinations are made in each step (in the absence of pulp), i.e. with only the reagents. This determination gave good replicate data for pulps the yields of which were up to 90 per cent, with lignin contents up to 25 per cent.

Georg Jayme and Hans-Joachim Jerratsch. **Das Papier** 14, 718-23 (1960) (In German).

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	10.00— 10.50
Soft unbleached muslins	13.50— 14.00
Fancy shirt cuttings	2.00— 3.00
No. 1 percales	4.00— 5.00
No. 1 washables	2.00— 2.25
No. 1 light silesias	6.50— 7.00
No. 1 light prints	3.00— 4.00
Light flannelettes	5.50— 6.00
Cottonades	2.25— 2.50
Blue overall cuttings	5.00— 5.50
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	8.50— 9.00
Underwear cuts, bleached	10.50— 11.00
Underwear cuts, unbleached	10.50— 11.00
Sun tan khaki cuttings	5.00— 5.50
America linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York.

	per cwt.
No. 1 roofing (Chicago)	.50— .55
No. 2 roofing (Chicago)	.50— .55
Twos and blues, repacked	2.00— 2.25
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

	per cwt.
New dark cuttings	Nominal
New mixed cuttings	
New light silesias	
Light flannelettes	
Unbleached cuttings	
New white cuttings	
New light oxfords	
New light prints	

Old Rags

	per cwt.
No. 1 white linens	Nominal
No. 2 white linens	
No. 3 white linens	
No. 4 white linens	
No. 1 white cottons	
No. 2 white cottons	
No. 3 white cottons	
No. 4 white cottons	
Extra light prints	
Ordinary light prints	
Medium light prints	
Dutch blue cottons	
French blue cottons	
French blue linens	
Checks and blues	
Linsey garments	
Dark cottons	
Old shopperies	

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	85.00— 90.00
No. 1 hard white shavings	70.00— 75.00
No. 1 soft white shavings	45.00— 50.00
Soft white shavings uncoated	55.00— 60.00
Fly leaf shavings No. 1	17.00— 22.00
Fly leaf, woody, No. 1	17.00— 20.00
Mixed colored shavings	16.00— 18.00
No. 1 books and magazines	13.00— 15.00
Ledger stock, white, No. 1	40.00— 45.00
Ledger stock colored, No. 1 (Midwest ship)	30.00— 32.50
New manila envelope cuttings (free of groundwood)	50.00— 55.00
New manila envelope cuttings (containing groundwood)	40.00— 45.00
Manila tab cards	50.00— 55.00
Colored tab cards	40.00— 42.50
New northern kraft envelope cuttings	50.00— 55.00
Triple sorted kraft, 100%	30.00— 32.50
No. 1 old kraft	22.50—
White news cuts, No. 1	40.00— 45.00
No. 1 overissue news	17.00— 19.00
Folded news, special	11.00— 13.00
Folded news, ordinary	9.00— 10.00
Old corrugated boxes	13.00— 14.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	2.00— 3.00
No. 1 mixed paper	1.00— 4.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	160.00—
L. c. l., ton	170.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	11.00— 17.00
300-mesh bags, c.l., Georgia works, ton	13.50— 22.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	23.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.25—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.28⅞—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb.	.13¼—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	15.75—
N	16.00—
WG	17.00—
WW	17.50—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	12.00— 15.25
N	12.35— 15.60
WG	12.55— 15.85
WW	12.85— 16.25
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	6.73—
Pearl, 100-lb. bags, cwt.	6.58—
Powdered, 100-lb. paper bags, cwt.	6.78—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09½—
High-tinting, drums, c. l., lb.	.14½—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.12½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.14 —

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	140.00—
Bleached sulfite, Canadian	140.00—
Unbleached sulfite	—
Unbleached sulfite, Canadian	125.00—
Bleached soda	130.00—135.00
Bleached soda, Canadian	135.00—140.00
Kraft, bleached hardwood	135.00—140.00
Kraft, bleached	145.00—150.00
Kraft, bleached southern	135.00—140.00
Kraft, bleached Canadian	150.00—
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	130.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite Swedish, freight allowed	140.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	140.00—
Bleached sulfite, Finnish, freight allowed	140.00—
Unbleached sulfite, Swedish, freight allowed	125.00—130.00
Unbleached sulfite, Finnish, freight allowed	125.00—130.00
Kraft, unbleached, Swedish, freight allowed	125 00—
Kraft, unbleached, Finnish, freight allowed	125 00—
Kraft bleached, Swedish on dock	157.00—162.50
Kraft, bleached, Norwegian	155 00 -

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more)	
Plain chip	
News vat lined chip	
.009 chip, rolls	
Filled news	
Solid news	
White vat lined chip	
Chip tube and can stock	
Single manila lined chip	
Single jute lined chip	
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	
White patent coated	
.020	
.018	
.016	
Book Paper (f.o.b. Chicago, c.l. skids per cwt):	
No. 1 enamels	20.80
No. 2 enamels	19.80
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	9.00
60-lb	9.25
50-lb.	9.50
40-lb.	9.75
35-lb.	10.25
30-lb.	11.00
25-lb.	11.75
20-lb.	12.75
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.50
(Sheets — Plus 50c cwt)	

NAMES IN THE NEWS

continued from page 52

Ont. Anderson has held many senior mill responsibilities in the company including project manager for Abitibi in New Zealand.

Central Ohio Paper Co.

J. F. Page Jr. is the new manager of the Cleveland division of Central Ohio Paper Co. He succeeds William Jones. Page, who has been assistant division manager of the company, joined the firm in 1949.

Equitable Paper Bag Co. Inc.

Jack Kaltman has been appointed general manager of the Flexible Packaging Division of Equitable Paper Bag Co. Inc., Long Island City, N.Y. Kaltman previously was with Visking Co.

Dobeckmun Co.

Six new sales representatives have been assigned to sales territories across the nation for Dobeckmun Co., a Division of Dow Chemical Co.

William D. Fetzer is assigned to the Houston, Tex. office.

Theodore C. Ley is assigned to Philadelphia, Pa.

John B. Greer is assigned to Atlanta, Ga.

Lawrence W. Rockwell is in Cleveland, O.

Erle Brown is based in Seattle, Wash.

Donald C. DeChant is assigned to Los Angeles, Calif.

Chesapeake Corp. of Virginia

Harrision P. Baldwin, former engineering supervisor of East Texas Pulp & Paper Co., Evadale, Texas, is now maintenance superintendent of Chesapeake Corp. of Virginia.

Bowaters

Richard L. Betts has been named paper mill manager for Bowaters Carolina Corp., Catawba, S. C. Betts joins Bowaters with over 20 years experience in the pulp and paper industry.

Jack E. Chinn has been appointed assistant paper mill manager for Bowaters Carolina Corp. Chinn was formerly employed as technical superintendent by Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

W. Lester Brown has been promoted to land management forester for Catawba Timber Co. Brown joined the Bowater organization in 1955 as a forester at Hiwassee Land Co.

John K. Dyer has been named production manager — pulp at Bowaters Southern Paper Corp., Calhoun, Tenn. Dyer joined Bowaters in 1954 as assistant sulfate superintendent, and has since served as sulfate superintendent and general superintendent.

Walter J. Parson has been named production manager — newsprint for Bowaters Southern. Parson has been paper mill superintendent and general manager — newsprint.

Fred Hund has been appointed assistant controller of Bowaters Southern. Hund previously was office manager and chief accountant.

Clarence Wilson has been named assistant treasurer of Hiwassee Land Co., Calhoun, Tenn. Wilson was formerly woods accountant.

NECROLOGY

G. Elmer Emigh

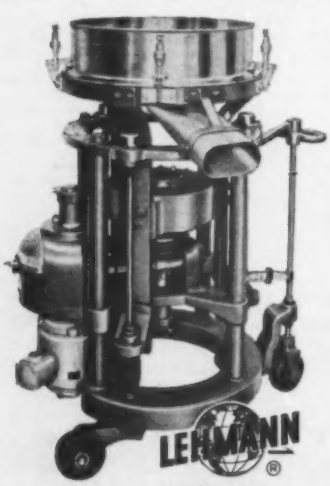
G. Elmer Emigh was sales engineer in the Southern West Coast area for Sandy Hill Iron and Brass Works since his retirement from the paper industry in 1954. Emigh held positions as assistant superintendent and superintendent for International Paper Co., Crown Zellerbach, St. Helens Pulp and Paper Co., Filer Fiber Co. and Pioneer Flintkote Co.

Frederick W. Benda

Frederick W. Benda was secretary and general manager of the Toledo Paper Box Co. in Toledo, O. Benda had been with the box company for 27 years and was territorial director of the Folding Paper Box Association of America.

Edmund E. Barrett

Edmund E. Barrett was president of the Canadian Woodpulp Corp. in New York until it was dissolved last year. Barrett was the first and only president of the company, organized five years ago as a wholly owned subsidiary of the Great Lakes Paper Co. of Fort William, Ont.



world renowned in processing machinery

The LEHMANN VORTI-SIV

has surprised the

PAPER INDUSTRY

This amazing screening machine never fails to impress paper mill executives who see it at work on: starch, clay and latex coatings; pigment slips; beater starch; tall oil; debarker water; and other materials. Some of the advantages are: use of finer mesh screens, fewer rejects, increased capacities, better product control and generally improved results. The gyratory action of the VORTI-SIV is adjustable both in speed and amplitude of gyration, to suit the material processed. It screens solids, liquids and slurries in meshes from 4 to 400. The screen is practically non-blinding.

Write for further information or a demonstration in our plant — or contact the Lehmann distributor nearest you.

J. M. LEHMANN COMPANY, Inc., Lyndhurst, N.J.

or

The R. P. Anderson Co. 2503 W. Mockingbird Lane Dallas, Texas	Halsell Brokerage Co. 3101 Walnut Street Denver 5, Colorado	Geo. E. Missbach & Co. 3330 Peachtree Road, N.W. Atlanta 5, Georgia	Wm. B. Sandford, Inc. 601 West 26th Street New York, New York
Chas. L. Burks & Co. Post Office Box 54 East Point, Georgia	Harry Holland & Son, Inc. 10600 Puritan Avenue Detroit 38, Michigan	Morton-Myers Co. 220 E. Missouri Avenue Kansas City 6, Missouri	E. C. Swift Co. 3537 Lee Road Cleveland 20, Ohio
Duncan Equipment Co. 506 Broadway Seattle 22, Washington	Geo. R. Mellema Co. 620 Plymouth Building Minneapolis 3, Minnesota	Rawdon Myers Agency Blue Ash Center Bldg. Cincinnati 42, Ohio	Webster Equipment Co. 549 W. Randolph St. Chicago, Illinois

Sada y Himes S.A., Apartado 911, Padre Mier 1250 Pte., Monterrey, N.L., Mexico

See our advertisement in Chemical Engineering Catalog

For more data circle 146 on Post Card

INDEX TO ADVERTISERS

Albany Felt Company 9
Allied Chemical Corp., General Chemical Division 11
Alvey Conveyor Manufacturing Co. .....
American Defibrator, Inc. .....
American Potash & Chemical Corp. 6
American SF Products, Inc. .....
Ampco Metal, Inc. .....
Anglo-American Clays Corporation .....
Anheuser-Busch, Inc. .....
Antara Chemicals .....
Appleton Wire Works, Inc. .....
Appleton Wood Products Co. .....
Archer Blower & Pipe Co., Inc. .....
Asten-Hill Mfg. Co. ..... 2nd Cover
Atlantic Coast Line Railroad .....
Atlas Refinery, Inc. ..... 4th Cover

Babcock & Wilcox Co., The, Tubular Products Div. .....
Bailey Meter Company 1
Barrett-Cravens Company 64
Bauer Bros. Co., The 17
Beloit Iron Works .....
Black-Clawson Company, The 4
Bolton & Sons, Inc., John W. .....

Carthage Machine Co. 67
Celgar Limited 37-38
CIBA Company, Inc. .....
Classified Advertising 66, 67
Clinton Corn Processing Co. .....
Conoflow Corporation .....
Curtiss-Wright Corporation .....

Dearborn Chemical Company .....
Dempster Brothers 18
De Zurik Corporation 68
Diamond Power Specialty Corp. .....
Dietz Machine Works .....
Dow Chemical Co. .....
Draper Brothers Company .....
Du Bois Chemicals, Inc. .....
Dusenbery Company, Inc., John .....

Egan & Co., Frank W. .....

Fabri-Valve Company of America .....
Fairbanks, Morse & Company 21
Fiske Brothers Refining Co., Lubriplate Div. 49
Foote Bros. Gear & Machine Corp. .....
Fritz Publications, Inc. 67

General Dyestuff Company 34
Georgia Kaolin Company .....
Goslin-Birmingham Mfg. Co., Inc. .....
Great Lakes Carbon Corp., Dicalite Dept. .. 36

Hamblet Machine Co. .....
Hanchett Manufacturing Co. 71
Hubinger Company, The .....
Humphrey Elevator Company .....
Huyck Felt Co. 19

Illinois Gear & Machine Co. .....
Improved Machinery, Inc. 58
Inglis Co. Limited, John .....

James Gear Mfg. Co., D. O. 20
Jamesbury Corp. .....
Jenkins Sons, Inc., M. W. 62
Johns-Manville 16
Johnson Corporation, The .....
Joliet Equipment Co. 52
Jones Corporation, E. D. 47-48

Kalamazoo Tank & Silo Co. 46
Kamyr, Inc. .....
Knox Woolen Company 61

Lamb-Grays Harbor Co., Inc. .....
Langston Co., Samuel M. .....
Layne & Bowler, Inc. .....
Lehmann Co., Inc., J. M. 70
Lindsay Wire Weaving Co., The .....
Link-Belt Company 12-13
Lodding Engineering Corp. .....
Lubriplate Div., Fiske Brothers Refining Co. 49

Main, Inc., Charles T. 66
Marathon, Div. of American Can Co. 14
Moisture Register Co. .....
Moore & White Company .....
Mount Vernon Mills, Inc. .....
Mullis Eng. & Mfg. Co., Carl W. .....
Murray Mfg. Co., D. J. 59

Nashua Industrial Machine Corp. .....
National Safety Council 66
Naylor Pipe Company .....
Nichols Engineering & Research Corp. 7
Norgren Co., C. A. .....
Norton Company 8

Orr Felt & Blanket Co. .....
Overly's Incorporated .....

Paper Converting Machine Company 35
Paper Industry, The 67
Parsons & Whittemore Inc. .....
Penick & Ford, Ltd., Inc. 60
Perkins & Son, Inc., B. F. 1
Photovolt Corporation 67
Poirier Control Company .....
Portland Copper & Tank Works, Inc. .....
Post Machinery Co. .....

Charles P. Raymond Service, Inc. .....
Red-Ray Mfg. Co., Inc. 64
Reichhold Chemicals, Inc. .....
Ross Engineering, J. O. .....
Ross Midwest Fulton Corp. 63
Roy & Son, B. S. .....

Sandy Hill Iron and Brass Works .... 3rd Cover
Scapa Dryers, Inc. .....
Screw Conveyor Corporation .....
Shuler & Benninghofen 45
Sinclair Company, The .....
Smidth & Co., F. L. .....
Sonoco Products Company .....
S-P Manufacturing Corp., The .....
Spraying Systems Co. .....
Staley Mfg. Co., A. E. .....
Standard Oil Co. (Indiana) .....
Stebbins Engineering & Mfgr. Co. 61
Steinen Mfg. Co., Wm., Industrial Nozzle Div. .....
Stickle Steam Specialties Co. 54
Swenson Evaporator Company 50

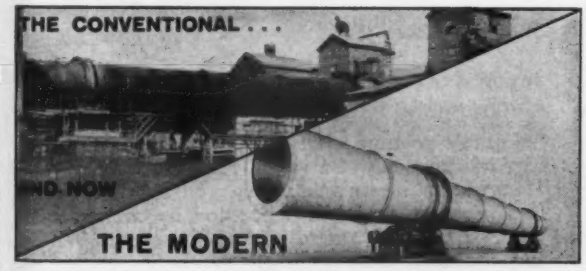
Taylor-Wharton Co. .....
Tennessee Corporation 56
Texas Gulf Sulphur Co. 43
Transall, Inc. 40

Union Asbestos & Rubber Co. .....

Valley Iron Works Corp. 10
Vanderbilt Co., R. T. .....
Vulcan Iron Works Inc. 71

Weyerhaeuser Timber Co. .....
Whiting Corporation 50
Whitney Chain Company .....
Williams-Gray Company .....
Wisconsin Wire Works .....

FOR 111 YEARS . . . VULCAN HAS DESIGNED AND BUILT



ROTARY KILNS

The Vulcan Iron Works, Inc., in Wilkes-Barre has the "know-how" when it comes to designing and building rotary kilns for any application.

From kilns built years ago which were held together by rivets, TO the modern patented Vulcan kiln of today, electronically welded and designed for years of trouble free service. . .

If you are in the market for a kiln, why not let Vulcan give you some suggestions and preliminary drawings for your consideration.

"THE OLDEST NAME IN ROTARY KILNS"

VULCAN IRON WORKS, INC.,

WILKES-BARRE, PA. • CABLE ADDRESS: VULWORKS

ROTARY KILNS, COOLERS, DRYERS, RETORTS, CALCINERS, VERTICAL LIME KILNS, BRIQUETTING PRESSES, ELECTRIC HOISTS, SHEAVES, SUGAR MILLS, EDGE RUNNERS

For more data circle 147 on Post Card

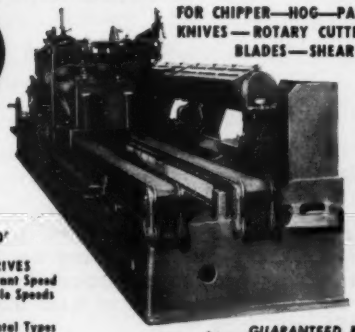
HANCHETT KNIFE GRINDERS

MODEL AK AUTOMATIC

FOR CHIPPER—HOG—PAPER—VENEER KNIVES — ROTARY CUTTERS — DOCTOR BLADES — SHEAR BLADES, ETC

EXTRA HEAVY DUTY Traveling Wheel Type

Capacity— 84" to 396"
Motors— 7½ to 40 HP
Speeds—10' to 100' and faster
TRANSMISSION DRIVES
Mechanical—Constant Speed
Hydraulic—Variable Speeds
WHEELS
Cylinder or Segmental Types
16 — 20 — 24" Diameter



1. Guaranteed Construction
2. Finest Materials
3. Advanced Design
4. Quiet, Smooth Running and Entirely
5. Free of Shock or Vibration

GUARANTEED PERFORMANCE
REAL WORK HORSES

We Guarantee our Machines to Deliver the Maximum in Precision Ground Knives per Hour with the Finest and Sharpest Edges for Longer and Better Cutting Action

MODEL GK AUTOMATIC

HEAVY DUTY Traveling Table Type

Capacity — 32" to 196"
Motors — 5 - 7½ - 10 - 15 HP
Table Speeds — Hydraulic (10' to 50' per min.); Mechanical (Constant)
Gears — Hardened
Bearings — Ball and Roller Types

TABLE DRIVES
Mechanical
Hydraulic
Electrical

OTHER MODELS
MODEL "DN" — For normal knife requirements — Sizes — 32" to 108"; Motors — 3 - 5 HP; Wheels — 10" to 14" Diameter — also Straight Wheel and Circular Knife Grinders

HANCHETT MANUFACTURING COMPANY
Main Plant BIG RAPIDS, MICHIGAN
West Coast PORTLAND 1, OREGON

For more data circle 148 on Post Card

whither?

in production
processes
new products
markets

New industrial rubber lining

A new industrial rubber lining can be cold-bonded to metal and other surfaces by means of a specially compounded tie-gum backing to provide complete protection against impinging abrasion and chemical action of most inorganic salts, alkalis and acids.

The new lining material was developed by The Goodyear Tire & Rubber Co. Field application of the lining requires only cleaning of the surface and spreading the cement. The chemical cure resulting from the action of the cement results in adhesion far superior to that provided by conventional cements.

New anti-slip surface finish

A new anti-slip surface finish is available for use on floors, ramps, stairtreads, etc. The product, based on polysulfide modified epoxy on which fine or coarse abrasive grains are sprinkled, is said to adhere strongly to wood, metal, cement and floor tile.

New mortar for construction

A new mortar compounded of various organic chemicals is reported to make brick and tile joints as strong as these structural materials themselves. The resulting structural strength in the mortar-to-brick bond is said to be five times as strong as a conventional bond. Final field tests to substantiate these claims are still to be made.

Jumbo garbage bags to replace cans

The traditional garbage can is being replaced in some parts of Europe as a result of the recent introduction of large-size, disposable, heavy-duty paper bags. There should be a tremendous market for such wet-strength, resin-treated bags in this country. According to one European household's requirements, a year's supply of such garbage bags may be procured for $2.80.

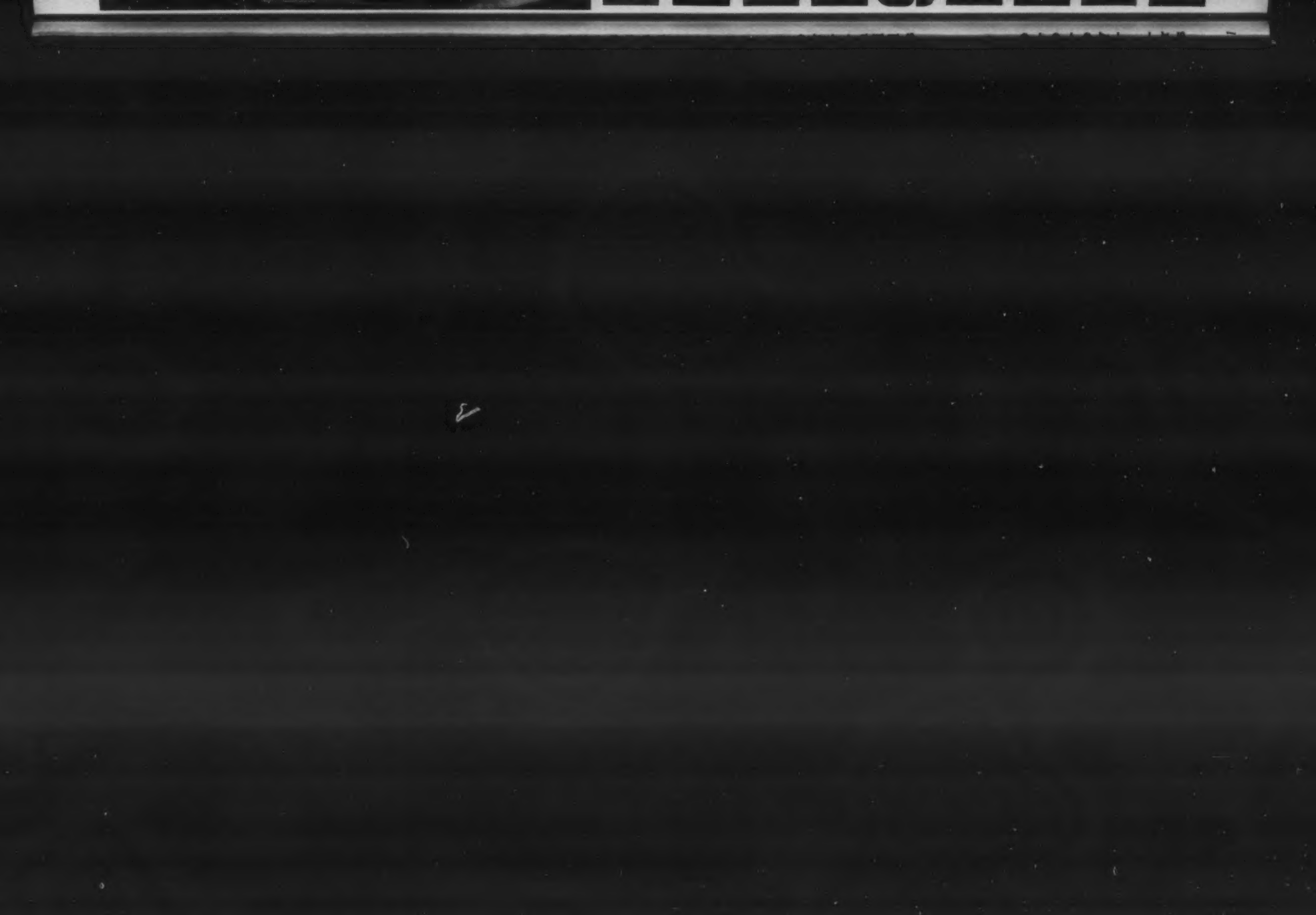
Japan expected to enter world chemical markets

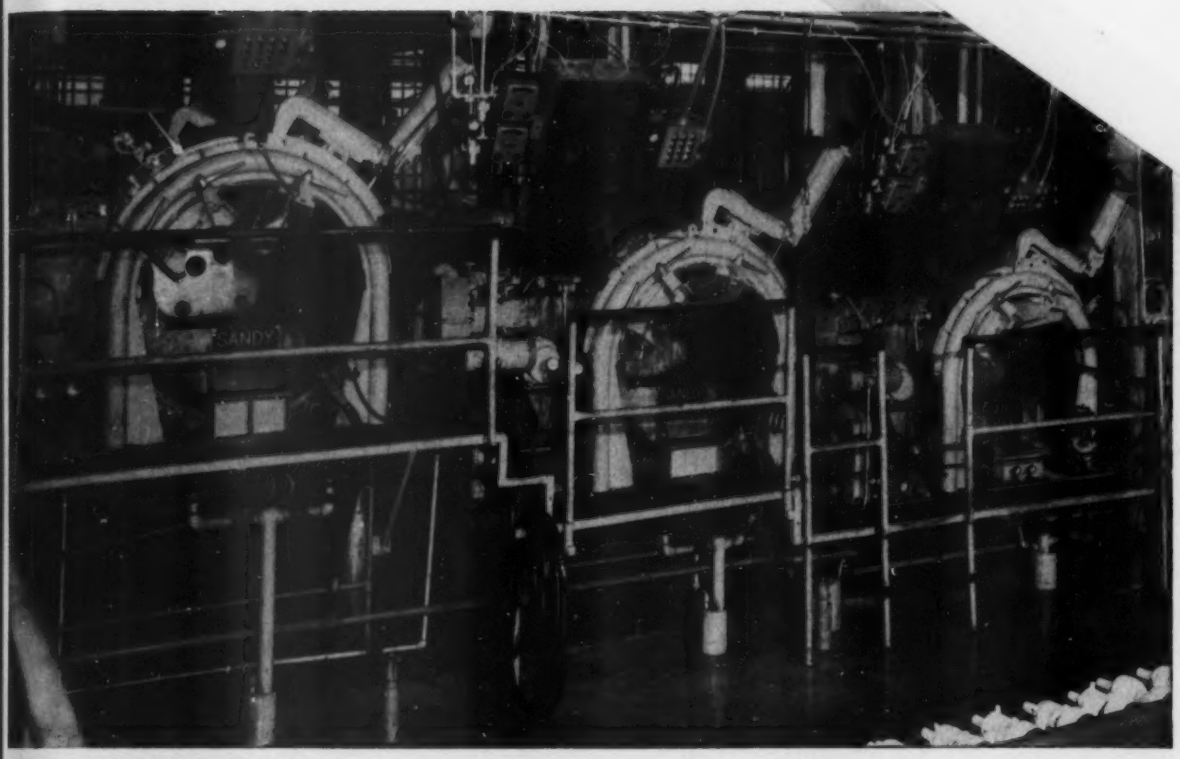
Japan's economy has been growing at the rate of 11.3 per cent between 1955-1959. The year 1955 marks Japan's launching of its petrochemical program which has boosted its chemical industry's growth to a rate of 14.2 per cent. Within the chemical industry itself, synthetic resins and plastics grew during this period at an annual rate of 29.8 per cent and the synthetic organics at a rate of 26.1 per cent.

Low-friction surface on rubber

A low-friction surface that is slippery to the touch can be imparted on rubber by graft-polymerizing chemically active monomers to the elastomer surface. The graft-polymer is then hydrolyzed and fluorinated to produce a surface with low dipole force. The process, developed by Quantum Inc., does not impair the rubber's inherent properties such as elasticity, etc.

The new product should find extensive application in dynamic seals (such as lip seals for rotary and reciprocating shafts), weather seals on doors and windows, etc.





NOW... FIRST MULTI-UNIT ROTOFORMER SET-UP MAKES PAPER-MAKING HISTORY

■ The first 3-unit arrangement of the ROTOFORMER, Sandy Hill's revolutionary papermaking machine, is now in successful use at Sorg Paper Company, Middletown, Ohio. The superiority of the multi-unit Rotoformer over the 5-vat wet end which it replaced is proved through better sheet formation, drier sheet delivery into the press section, space savings, economies in felt life and felt cleaning, simplicity of operation — plus many other advantages. Our new laboratory is ready to show you what the Rotoformer can do for you.

TEST YOUR STOCK ON OUR LABORATORY ROTOFORMER

PATENTED
Other patents applied for

Call or write us today for your copy of the Sandy Hill Rotoformer catalog section.

THE SANDY HILL IRON AND BRASS WORKS
HUDSON FALLS, N. Y.

For more data circle 149 on Post Card

PROBLEM SOLVED

with Atlas

239

PAPER COATING ADDITIVE

The problem originally was to develop a coating mixture which would give to the adhesive films, in coating formations, an unusual flexibility.

Such flexibility would tend to eliminate calander dusting and yet, not affect drying.

Atlas 239 is the answer to this problem! It is a blend of plasticizing lubricants . . . a smooth white paste to be added to the coating slurry.

What has happened?

- higher gloss
- greater brilliance
- better folding
- greater ink absorption
- no need for anti-foam compound
- better color flow
- no dusting
- easier handling

All these improvements may not occur at once (much depends upon adjacent ingredients in the coating formula), but always some occur, and sometimes all.

We ship *ATLAS* 239 in 55-gallon open-head fiber cartons, non-returnable, or steel drums. You don't have to store it specially, although if you prevent it from freezing you can remove it from containers more easily.

ATLAS REFINERY, INC. SINCE 1887 PROCESSING CHEMICALS NEWARK, N.J.

Serving Industry since 1887

Atlas **REFINERY, INC.**

142 LOCKWOOD STREET, NEWARK 5, NEW JERSEY

110 FRANKLIN STREET, CHICAGO 6, ILLINOIS

WAREHOUSES . . . CHICAGO • MILWAUKEE • KALAMAZOO
APPLETON • SALEM, MASS. • NEWARK

For more data circle 150 on Post Card